

**Rogue River Siskiyou National Forest Chetco Bar Fire Salvage Project  
Biological Assessment**

Revision 25 April 2018

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## 1. INTRODUCTION

### 1.1 Purpose of the Assessment

The Rogue River-Siskiyou National Forest (RRSNF) is submitting this Biological Assessment (BA) to the US Fish and Wildlife Service (Service) pursuant to Section 7 (a)(2) of the Endangered Species Act (ESA). Section 7 (a)(2) requires Federal agencies to consult with the Service to ensure their actions would not jeopardize the continued existence of any listed species or adversely modify designated critical habitats. Conservation measures described in this BA also meet obligations under Section 7 (a)(1) to conserve habitat.

This Biological Assessment (BA) describes and evaluates the potential effects from the proposed area salvage on the Chetco Bar fire that occurred on the forest in 2017, as described in Alternative 2. All treatments would occur on the RRSNF over the next one to two years. The Forest requests concurrence for the portion of the project that may affect, and likely adversely affect (NLAA) the northern spotted owl, marbled murrelet, and their critical habitats. Also, the Forest requests a biological opinion for those proposed actions that may affect, likely to adversely affect (LAA) the northern spotted owl (NSO) and its designated critical habitat and disturbance to marbled murrelets (MAMU). These projects may occur in spotted owl designated critical habitat as well as marbled murrelet designated critical habitat.

As no proposed activities under the Biological Assessment will occur within disturbance distances of any known wolf den or rendezvous sites the Forest will rely on the Forest-Wide programmatic Letter of Concurrence (Tails # OEOFW00-2015-I-0046)) for any potential effects from any proposed activity for the gray wolf.

No other listed species or designated critical habitat would be affected by the activities identified in this BA.

### 1.2 Consultation History

The plan for this BA was discussed at several meetings, via phone and email with the Level 1 and 2 representatives of the Forest and Service in December of 2017 and in January and February of 2018. The Level 1 team includes the Rogue River-Siskiyou National Forest Biologist the Roseburg Fish and Wildlife Office Biologist. Members of the level 1 team conducted a field trip on December 13 and 14 of 2017 to observe habitat conditions in the fire area.

In addition, the USFWS field biologist participated on the Project interdisciplinary team throughout project development and visited the field with the Project biologist on February 6 and 7 of 2018 to review potential effects of the proposed actions on habitat in the project area.

### 1.3 Northern Spotted Owl Recovery Plan

On June 30, 2011, the US Fish and Wildlife Service (Service) released the Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*) (USDI FWS 2011). The Notice of Final Revised Recovery Plan Availability was published in the Federal Register on July 1, 2011 (76 FR 38575-38576) for the NSO. Recovery plans are not regulatory documents; rather, they provide guidance to bring about recovery and establish criteria to be used in evaluating when recovery has been achieved. The Forest continues to work with the Service to incorporate

Recovery Goals and Actions consistent USFS laws and regulations. The RRSNF is a participant in the inter-organizational spotted owl working group (Recovery Action 1) and would continue demographic monitoring to address Recovery Actions 2 and 3.

Three recovery actions (RA) are pertinent to the proposed action (RA10, 12, and 32) (Table 1).

**Table 1. NSO Recovery Actions applicable to Chetco Bar Area Salvage.**

Recovery Action	Description	Applicable Recommendations
10	<i>Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population</i>	<p>Intent of this recovery action is to protect, enhance, and develop habitat in the quantity and distribution necessary to provide for the long-term recovery of spotted owls.</p> <p>An interagency, interdisciplinary team composed of RRNF and the Medford and Grant's Pass BLM staff was assembled to develop a methodology for identifying and prioritizing high quality spotted owl sites as described in RA 10 (USDA FS, USDI BLM and USDI FWS 2013)</p> <p>This project did not identify treatments based on habitat conditions because it is a fire salvage project. For the purpose of this analysis, sites were not prioritized for treatments or conservation, rather all NSO sites are assumed occupied with potential to contribute to demographics of the local population unless otherwise indicated due to extreme impacts from high severity fire. Proposed salvage activities will not modify existing NRF or dispersal habitat.</p> <p>Project design criteria (PDC) have been incorporated to retain large legacy snags and large down wood that may contribute to future high quality habitat. See snag and down woody requirements in the proposed action.</p>
12	<i>In lands where management is focused on development of spotted owl habitat, post-fire silvicultural activities should concentrate on conserving and restoring habitat elements that take a long time to develop (e.g., large trees, medium and large snags, downed wood)</i>	<p>Intent of this recovery action is to focus on conserving and restoring habitat elements that take a long time to develop in areas that are important to spotted owl conservation. These elements include legacy components, large trees and snags, and large downed wood for the benefit of future stand development.</p> <p>PDCs have been incorporated to retain large legacy snags and down wood that provide important habitat components in a developing stand of future suitable habitat and will contribute to future large woody debris.</p>
32	<i>Federal and non-federal landowners should work with the Service to maintain and restore older and more structurally complex multi-layered conifer forests allowing for other threats, such as fire and insects to be addressed by restoration management actions.</i>	<p>Maintaining forests with high-quality habitat will provide additional support for reducing key threats faced by NSO; protecting these forests should provide NSO high-quality refugia habitat from negative competitive interactions with barred owls that are likely occurring where the two species' home ranges overlap.</p> <p>An interagency, interdisciplinary team composed of RRNF and the Medford and Grant's Pass BLM staff was assembled to develop a methodology for identifying Recovery Action 32 structurally complex forest for project level planning and NSO consultation needs in SW Oregon (USDA FS, USDI BLM and USDI FWS 2010).</p> <p>Salvage activities will not modify RA32 habitat.</p>

## **1.4 NSO Critical Habitat**

Critical habitat for the NSO was originally designated in 1992 (57 FR 10:1796-1837). Critical habitat was revised in 2008 (73 Federal Register 157:47326) and became effective on September 12, 2008. The 2008 USFWS's critical habitat (CH) delineation was challenged in court and the 2008 designation of northern spotted owl CH was remanded and the USFWS was ordered to revise the CHU designation. On February 28, 2012, the Service released the proposed critical habitat in the form of maps and the draft form of the federal register publication. The final rule was published in the Federal Register on December 4, 2012 and became effective January 3, 2013 (77 Federal Register 233:71876-72068).

Section 4(a)(3) of the Act specifies that the Service shall designate critical habitat for endangered or threatened species and may, from time-to-time thereafter as appropriate, revise such designation. Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features that are essential to the conservation of the listed species and which may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of a listed species. Past regulations emphasize "primary constituent elements," or PCEs, in identifying these physical or biological features. Recent revisions to the regulations rely on the physical or biological features (PBFs) essential to the conservation of the northern spotted owl are forested lands that are used or likely to be used for nesting, roosting, foraging, or dispersing; that are from this time forward are to be used.

### **Physical and Biological Features (PBFs) of 2012 Designated Critical Habitat**

Based on current research on the life history, biology, and ecology of the northern spotted owl and the requirements of the habitat to sustain its essential life history functions, as described above, the Service has identified the following PBFs for the northern spotted owl are:

- 1) Forest types that may be in early-, mid-, or late-seral states and support the northern spotted owl across its geographical range**
- 2) Habitat that provides for nesting and roosting.** This habitat must provide:
  - a) Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year.
  - b) Stands for nesting and roosting that are generally characterized by:
    - (i) Moderate to high canopy closure (60 to over 80 percent),
    - (ii) Multilayered, multispecies canopies with large (20- 30 in (51-76 cm) or greater diameter at breast height (dbh) overstory trees,
    - (iii) High basal area (greater than 240 ft<sup>2</sup>/acre (55 m<sup>2</sup>/ha)),
    - (iv) High diversity of different diameters of trees,
    - (v) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence)
    - (vi) Large snags and large accumulations of fallen trees and other woody debris on the ground, and
    - (vii) Sufficient open space below the canopy for northern spotted owls to fly.

- 3) **Habitat that provides for foraging.** Foraging habitat varies widely across the northern spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions.
- 4) **Habitat to support the transience and colonization phases of dispersal,** which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PBFs (2) or (3)), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging habitat. In cases where nesting, roosting, or foraging habitats are insufficient to provide for dispersing or nonbreeding owls, the specific dispersal habitat PBFs for the northern spotted owl may be provided by the following:
  - a) Habitat supporting the transience phase of dispersal, which includes:
    - (i) Stands with adequate tree size and canopy closure to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 in (28 cm) dbh and a minimum 40 percent canopy closure; and
    - (ii) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.
  - b) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PBFs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

## **1.5 Murrelet Critical Habitat**

Critical habitat for marbled murrelets was designated in May 1996 (61 FR 102:26256-26320). The Service designated approximately 3.9 million acres of land as critical habitat, of which 78 percent (3.0 million acres) is located on Federal lands within the area covered by the NWFP boundary. On October 5, 2011 the Service published the revised critical habitat for the marbled murrelet and was effective November 4, 2011 (77 FR 193:615990-61621). Approximately 3,698,100 acres (1,497,000 ha) of critical habitat is now designated for the marbled murrelet. The critical habitat for marbled murrelet was revised by removing approximately 189,671 acres in northern California and southern Oregon from the 1996 designation. Based on new information these areas do not meet the definition of critical habitat. The areas being removed from the 1996 designation in northern California are within Inland Zone 2, where we have no historical or current survey records documenting marbled murrelet presence. Intensive surveys in southern Oregon indicate the inland distribution of the marbled murrelet is strongly associated with the hemlock/tanoak habitat zone, rather than distance from the coast. Accordingly, the areas removed in southern Oregon are limited to those areas not associated with the hemlock/tanoak zone.

The PBFs identified in the May 24, 1996, final critical habitat designation (61 FR 26254) were not revised and remain applicable to the final revision of critical habitat for the marbled murrelet. The Service considers two components of marbled murrelet habitat to be biologically essential: (1) terrestrial nesting habitat and associated forest stands and (2) marine foraging habitat used during the breeding season.

### **Physical and Biological Features of Murrelet Critical Habitat**

The PBFs are habitat elements the Service determines are essential to a species' conservation (i.e., recovery) and require special management considerations. Within areas essential for successful marbled murrelet nesting, the Service has focused on the following physical and biological features: (1) individual trees with potential nesting platforms; and (2) forested lands of at least one half site potential tree height regardless of contiguity within 0.8 kilometers (0.5 miles) of individual trees with potential nesting platforms, and that are used or potentially used by murrelets for nesting or roosting (USDI FWS 1996, page 26264). Within the boundaries of designated critical habitat, only those areas that contain one or more physical or biological features are, by definition, critical habitat.

The site-potential tree height is the average maximum height for trees given the local growing conditions, and is based on species-specific site index tables. These PBFs are intended to support terrestrial habitat for successful reproduction, roosting and other normal behaviors.

Reductions or removal of marbled murrelet habitat and critical habitat on the RRSNF from Forest activities has been extremely minimal since 1994.

## **1.6 Definitions**

### **Northern Spotted Owl Habitat Definitions and Habitat Treatment Definitions, including Habitats within NSO Designated Critical Habitat**

**Nesting, Roosting, and Foraging (NRF) Habitat** for the northern spotted owl consists of habitat used by owls for nesting, roosting, and foraging. Generally, this habitat is multistoried, 80 years old or older (depending on stand type and structural condition), and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. The canopy cover generally exceeds 60 percent, but canopy cover or age alone does not qualify a stand as NRF. Other attributes include a high incidence of large trees with various deformities (e.g. large cavities, broken tops, mistletoe infestations, and other evidence of decadence), large snags, large accumulations of fallen trees and other woody debris on the ground, and sufficient open space below the canopy for owls to fly (Thomas *et al.*, 1990).

In southwest Oregon, NRF habitat varies greatly, but is typified by mixed-conifer habitat, recurrent fire history, patchy habitat components, and a higher incidence of woodrats (a high quality spotted owl prey species). It may consist of somewhat smaller tree sizes. One or more important habitat components, such as dead down wood, snags, dense canopy, multistoried stands, or mid-canopy habitat, might be lacking or even absent in portions of NRF habitat in southwest Oregon. NRF habitat also functions as dispersal habitat.

NRF habitat that was burned at low severity is still considered to be functional. Low severity fire may have burn or scorch individual or small groups of trees and may result in some loss of the midstory but the multi-layered, complex forest with high canopy cover is still present. As these fire-affected trees die, they will fall and provide coarse woody debris. NRF habitat will not be treated by this project.

**Post Fire Foraging (PFF)** for the northern spotted owl is NRF that has burned at moderate to high intensity and may include occasional individual or small clumps of green trees but for the



most part are completely stand replaced and no longer function as nesting or roosting habitat, nor do they provide enough canopy cover for functional dispersal habitat. However, recent studies have shown that spotted owls may continue to utilize this habitat post fire. This is likely incumbent on the patch size of this habitat and its relationships to known owl sites, juxtaposition on the landscape, and other factors. There are differences in the spatial arrangement of spotted owl habitat, locations of activity centers, burn severities and scales of this type of habitat. Comprehensive analyses of the long-term effects of fire on use and occupancy within a landscape, especially the small scale effects to pairs or individuals, are limited. Recognizing these variations in study area conditions and methodologies, the best available literature indicates that NSOs may to some degree, use burned areas that were previously habitat, for nesting, roosting, and/or foraging, depending on the complex interaction of factors such as habitat quality pre-and post-fire, location of the burns in relation to NSO core use areas, and the size, severity, and patterns of the burn.

For this analysis, the Forest stratified PFF based on factors that influence the likelihood of use by owls. Primary PFF (**PFF1**) is post-fire foraging within 500 feet of existing NRF having high relative habitat suitability (RHS) which more likely to be used by foraging owls than secondary PFF (**PFF2**) which is beyond 500 feet from existing high RHS NRF. This accounts for the degree that the PFF contributes to habitat fitness (survival and reproduction) of NSOs at least in the short-term.

For example, PFF2 is characterized as patches of NRF burned at with moderate to high severity and have significant reductions of important habitat components (i.e. lack of stand structure, diversity, cover, or heterogeneity), are not adjacent to stands of suitable habitat, and are associated with abiotic factors such as aspect or slope position that may favor a high severity fire regime (Skinner 2002). PFF1 is characterized as patches of NRF that burned at moderate to high severity, but are interspersed in a mosaic of mixed severity and unburned habitat (within 500 feet of existing NRF), are located in portions of the landscape associated with use, and could still be utilized by NSOs.

There is much debate currently on the value of PFF to spotted owls, and the effects of salvage in burned habitat on owls. For a summary of research into the use of PFF by owls, and owl habitats see Bond et al. 2009, Clark 2007, Clark et al. 2011, Clark et al. 2013, Elliott 1985, Gaines et al. 1995, Jenness et al. 2004, King et al. 1998, Lee and Bond 2015a, Lee and Bond 2015b, Roberts et al. 2011, Jones and Peery 2018, Ganey et al. 2017, and Hansen et al. 2018.

**The action proposes to remove PFF.** Depending on where it is located in relation to owls, existing suitable habitat (PFF1 vs PFF2), the amount proposed to be removed within a specific area, and its relation to high or low relative habitat suitability modelling, this proposed action may be determined to be a **May Affect, Not Likely to Adversely Affect (NLAA)** or **Likely to Adversely Affect (LAA)** the northern spotted owl and is designated Critical Habitat

**Dispersal Habitat** is a subcategory of “all dispersal” habitat for northern spotted owls. All-dispersal is defined as dispersal plus NRF. Throughout this document, “dispersal” will be used to describe dispersal-only habitat. Thomas *et al.*, 1990, defined dispersal habitat as forested habitat more than 40 years old, with canopy closure more than 40 percent, average diameter greater than 11 inches, and flying space for owls in the understory and does not provide the components found in NRF. It provides temporary shelter for owls moving through the area between NRF habitats and some opportunity for owls to find prey; but it does not provide all of

the requirements to support an owl throughout its life. Dispersal will be used throughout this document to refer to habitat that does not meet the criteria to be NRF habitat (i.e., lacks high canopy cover, large tree component, structural complexity, decadence, etc. but has adequate cover to facilitate movement between blocks of NRF habitat). Dispersal habitat will not be treated by this project.

**Capable Habitat** for the northern spotted owl is forestland that is currently not habitat but can become NRF or dispersal in the future, as trees mature and the canopy closes. Much of this capable habitat was natural dispersal habitat prior to the fire and was stand replaced. Other capable habitats were young plantations less than 80 years old that may or may not have been classified as dispersal prior to the fire that were stand replaced

**Non-habitat** does not provide habitat for northern spotted owls and would not develop into NRF or dispersal in the future. The term 'unsuitable' is analogous to this.

### **Spotted Owl Potential Disturbance and Disruption**

Potential disturbance or disruption during the breeding season (Table 2) can occur from activities occurring near spotted owl sites that do not directly affect the spotted owl habitat itself.

Disturbance is also a possibility when spotted owl habitat is treated, however PDCs ensure activities would avoid adverse effects from disturbance to spotted owls (appendix C). Disruption may occur within disturbance distances during the critical breeding season and may lead to nest abandonments and chick loss which could result in adverse effects to individuals.

**Table 2: Northern Spotted Owl Breeding Periods**

Entire Breeding Period	Critical Breeding Period	Extended Breeding Period
March 1-September 30	March 1-June 30	July 1-September 30

### **Marbled Murrelet Habitat Definitions**

Marbled murrelet suitable habitat includes conifer-dominated stands generally at least 80 years old or more with trees averaging 20 inches dbh or more. At least one potential nest tree must be present in a stand of trees at least 1 acre in size (6 per 5 acre area) and the stand trees must be at least one-half the height of the site-potential tree.

### **Marbled Murrelet Suitable Structure**

Potential marbled murrelet nest trees occur within 50 miles (81 kilometers) of the coast (USDI 1997). Murrelets nest in one of four tree species: western hemlock, Douglas-fir, Sitka spruce, or western red cedar (Nelson and Wilson 2002). Nest trees are  $\geq 19.1$  inches dbh and greater than 107 feet in height, have at least one platform 4" inches or more in diameter, contain nesting substrate (e.g., moss, epiphytes, duff) on that platform, and have an access route through the canopy that a murrelet could use to approach and land on the platform (Burger 2002; Nelson and Wilson 2002). Nest trees have a tree branch or foliage, either on the tree with potential structure or on a surrounding tree, which provides protective cover over the platform (Nelson and Wilson 2002). Other important attributes of the platform are vertical and horizontal cover and substrate.

Known nest sites have platforms that are generally protected by branches above (vertical cover) or to the side (horizontal cover) (Huff et al. 2006, 14). Marbled murrelets appear to select limbs and platforms that provide protection from predation (Luginbuhl et al 2001, 558; Marzluff et al. 2000, 1135; Raphael et al. 2002b, 226 and 228) and inclement weather (Huff et al. 2006, 14). Substrate, such as moss, duff, or needles, on the nest limb is important for protecting the egg and preventing it from falling (Huff et al. 2006, 13)

The distance inland that marbled murrelets breed is variable and influenced by a number of factors including nesting habitat availability, climate suitability, maximum foraging range, and predation rates. Most murrelets appear to nest within 37 miles (60 km) of the coast (Miller and Ralph 1995); the Service (USDI 1997p.32) considers 50 miles (31 km) as the minimum inland distance for determining habitat suitability and amount within the listed range. Commuting distances are, however, extremely variable, with birds in Washington tending to commute larger distances than those in Oregon and California. The “Marbled Murrelet Effectiveness Monitoring Plan for the Northwest Forest Plan” (Madsen et al. 1999) considers the primary nesting range of the species to extend inland 35 miles (22 km) in Oregon. In Washington, Oregon and California, nests continue to be found below 2,625 feet (800 meters) in elevation (McShane et. al 2004).

**Marbled Murrelet Occupied Habitat** occurs when murrelets are located within stands by interagency established survey protocol (Evans Mack et al. 2003). Survey data collected by the Rogue River-Siskiyou National Forest (Forest Service) and BLM in southwestern Oregon (9,795 survey visits for murrelets between 1988 and 2001) indicate murrelets inhabit forested areas relatively close to the ocean. Murrelets have not been found more than 32 miles (51.5 kilometers) inland on the Powers Ranger District or more than 16 miles (25.7 kilometers) inland on the Gold Beach or Chetco Ranger Districts of the Rogue River-Siskiyou National Forest, located adjacent to Medford BLM (Dillingham et al. 1995; USDA and USDI 1996; USDA and USDI 2003, Appendix I). There are approximately 329,000 acres of suitable murrelet habitat located within those watersheds known to be occupied by murrelets on the RRSNF (Chetco, Smith, Elk, Rogue Lower Wild, Rogue Lobster, and the Coquille-Sixes). The Forest Service and BLM completed an evaluation to better quantify the likelihood of murrelet occurrence beyond the eastern boundary of the western hemlock/tanoak vegetation zone in southwest Oregon (USDA and USDI 2001). This evaluation refined the existing survey zone boundaries to better reflect known murrelet occurrence. Area A encompasses the known range of the marbled murrelet. Approximately 172,276 acres of suitable habitat are located in Area A on RRSNF lands. NWFP LSRs and other reserved areas contain 90 percent of the suitable habitat in Area A; any stands of suitable habitat in Matrix subsequently found to be occupied are designated as additional “Murrelet” LSR. Area B is a “buffer” to Area A and includes all land 6.2 miles (10 kilometers) east of Area A. Surveys are conducted only in Areas A and B. To date, murrelets have been documented as nesting mostly within area A and two occupied sites have been delineated in area B on the Rogue River Siskiyou National Forest. Federal land east of Area B is assumed to not contain murrelet habitat and is no longer surveyed. The Service concurred with the evaluation conclusions in a letter: *Technical Assistance on the Final Results of Landscape Level Surveys for Marbled Murrelets in Southwest Oregon* (USDI FWS reference: 1-7-02-TA-6401).

The analysis of landscape level protocol surveys which established survey areas A, B, C and D in 2002, incorporated the results of 9,795 surveys conducted between 1988 and 2001 (USDI FWS 2002). Statisticians reviewed survey data gathered between 1988 and 1998 and determined data

were not a random sample so murrelet occupancy could not be inferred. To create a statistically valid sample, an additional 17 survey sites were surveyed to protocol in 1999 and 2000. Ultimately, seven detections occurred within survey area B after 1,472 intensive surveys conducted from 1988 through 2001. One detection occurred in area C after 1,333 surveys, and none occurred in area D after 3,300 surveys. These results were the basis for establishment of the current survey areas for murrelets and were incorporated into the 2003 revision of the murrelet survey protocol (Evans Mack, et al. 2003).

Based on the above analysis, the likelihood of detecting murrelets within survey area B during one survey are less than 0.5 percent (1 in 200 chance). Extrapolating over the 10 surveys required by the protocol, the chance would increase to 4.8 percent (1 in 20 chance) of detecting murrelet presence at any one survey site over two years of surveys. The chance of nesting occurring is even lower since behaviors suggesting nesting were never observed in the 1,472 intensive surveys conducted in survey area B. Since the analysis occurred, several occupancy detections have been reported within survey area B. In 1992 and 2009 two occupied sites were established within survey area B as a result of surveys. Both sites are within ½ mile of survey area A, within ¾ mile of each other, and within the upper reaches of Lawson Creek. Consequently, while low, there may be more murrelets in Survey Zone B.

### Marbled Murrelet Potential Disturbance and Disruption

Potential disturbance can occur from activities occurring during the breeding season (Table 3) near marbled murrelet unsurveyed suitable habitat that do not directly affect marbled murrelet habitat itself. Disturbance is also a possibility when marbled murrelet habitat is treated, but PDC's (Appendix A) ensure activities would avoid adverse effects from disturbance to nesting murrelets. Disruption may occur within disturbance distances during the critical breeding season and may lead to nest abandonments and chick loss and would result in an adverse effects to the individuals.

**Table 3: Marbled Murrelet Breeding Period**

Entire Breeding Period	Critical Breeding Period	Extended Breeding Period
April 1-September 15	April 1-August 5	August 6-September 15

## 2. Project Site History and Status

### 2.1 Range-wide Status of NSO

A detailed account of the taxonomy, ecology, and reproductive characteristics of the spotted owl can be found in the *2011 Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011), the SEI 2004 northern spotted owl status review (Courtney *et al.* 2004); the Interagency Scientific Committee Report (Thomas *et al.* 1990); Forest Service Ecosystem Management Report (USDA *et al.* 1993), final rule designating the spotted owl as a threatened species (1990), and several key monographs (e.g., Anthony *et al.* 2004, 2006 and Forsman *et al.* 2004). These documents are incorporated by reference.

Lint et al 1994, identified 14 sample demographic study areas to represent owl status across the range of the northern spotted owl. Three of these have been dropped and 11 demography areas

remain (Forsman et al 2011). Owl sites and productivity are annually monitored within these areas to:

- *Assess changes in population trend and demographic performance of spotted owls on federally administered forest lands within the range of the owl and*
- *Assess changes in the amount and distribution of nesting, roosting, and foraging habitat and dispersal habitat for spotted owls on federally administered forest lands.*

The Southern Cascades demographic study area is the only spotted owl demographic area on the Forest. However, the Klamath Demographic Study Area, just north of the Forest on the Medford and Roseburg BLM is most representative of the habitat in the project Action Area. The Oregon Coast Range study area is also considered for comparison.

Metadata analysis evaluates population statistics of the owls in the demographic study areas. The last metadata analysis was completed in 2016. Although the statistics have many assumptions, and the data on owls is complex, basic lambda can be interpreted as follows.

- $\lambda = 1$ , the size of the population will not change
- $\lambda > 1$ , the population will grow
- $\lambda < 1$ , the population will decline

*Estimated mean annual rates of population change ( $\lambda$ ) suggested that Spotted Owl populations declined from 1.2% to 8.4% per year depending on the study area. The weighted mean estimate of  $\lambda$  for all study areas was 0.962 ( $\pm 0.019$  SE; 95% CI: 0.925-0.999), indicating an estimated range-wide decline of 3.8% per year from 1985 to 2013. The Klamath and Oregon Coast Range study area rates of change were -2.8% and -5.1% respectively. (Duggar et al 2016)*

Factors such as barred owl presence, amounts of suitable habitat and climate variables were evaluated for association with owl populations. Barred owl presence had a strong negative effect on spotted owl occupancy in 10 of the 11 study areas. Spotted owl survival was also affected by suitable habitat, local weather and regional climatic patterns, although the importance of these factors was inconsistent across study areas. In an early, short-term NSO demographic study on the Chetco and Gold Beach Ranger Districts from 1990-1993, three barred owls were detected and a negative correlation was found between fecundity and high precipitation during the nesting season. (Zabel et al 1996).

### **NSO Status within the Klamath Demographic Study Area**

Reports are published annually for the Klamath demographic study area (KSA) a study area adjacent to the RRSNF in the Klamath province. In recent years there has been a steady decline in the number of non-juveniles detected and an even larger decrease in the number of pairs detected in the study area.

While the 2011 meta-analysis (Forsman et al. 2011) indicated that survival on the KSA was stable through 2006, the report noted that the fecundity rate on the KSA was declining. Recent data agrees with this conclusion.

According to the FY 2017 Annual Report for the Klamath Demographic Study Area (Lesmeister et al. 2017), at least one spotted owl was detected at 31 (19.4%) of 160 known sites. Annual reports show a steady decline in the number of non-juveniles detected and number of pairs detected in the KSA since 2012. Fifty non-juveniles detected in 2016 was down from 134 in

2012, the lowest ever documented on the study area. The highest number of spotted owls in the study area was 222 individuals during 2002. Barred owls were located at 103 of the NSO sites (64 percent of the sites), eight times more than locations at 13 sites in 2002.

Likewise, the 18 NSO pairs detected in 2015 was down from 50 pairs in 2012 and a high of 98 pairs in 2005. Of the 18 sites, nesting status was determined at 15 sites. Nesting was documented at 4 sites and not nesting documented at 11 sites. Of the 4 nests, three successfully fledged young and one failed. Notably, four of the known NSO sites had a substantial amount of suitable habitat burned in 2015, and five additional sites had a substantial amount of suitable habitat severely burned in 2013.

In 2016 the Klamath demography study area team identified 50 individual, non-juvenile, spotted owls (28 males and 22 females) in 2017, resulting in a male: female ratio of 1.27:1. Of the 44 non-juvenile owls where age was determined, 41 (93.2%) were adults and 3 (6.8%) were subadults. A total of 6 owls were newly banded during 2017; 5 (83.3%) were fledglings, and 1 (16.7%) was an adult.

The fecundity rate for all age classes in the KSA during 2017 was 0.175, up from 0.074 in 2016.

### **Barred Owls**

There were at least 192 non-juvenile barred owls (*Strix varia*) detected at 100 sites on the KSA during 2016. They detected a pair of barred owls at 52 sites and a single at 48 sites. They compared the fecundity rate of spotted owls at sites with barred owl detections and sites without barred owl detections. The fecundity rate during 2016 was 0.000 (N=10) at sites with barred owl detections, and 0.118 (N=17) at sites without barred owl detections. The average spotted owl fecundity rate from 1999-2016 was 0.172 (N=105) at sites with barred owl presence, and 0.274 (N=1167) at sites without barred owl presence.

In recent years there has been a steady decline in the number of non-juveniles detected, a decrease in the number of pairs detected, and an increase in the number of unoccupied sites. The number of non-juveniles detected in 2016 (72) was the lowest ever documented on the study area. The number of non-juvenile individual spotted owls during 2016 was 67.6% fewer than the high of 222 during 2002. The decline in the number of pairs was even more sizeable than the decline of individuals, with 74.5% fewer pairs detected in 2016 than the high of 98 during 2005. The number of pairs detected on the study area has declined every year since 2005. The 25 pairs detected during 2016 was the lowest number documented during the study period.

## **2.2 Current Site History for NSO**

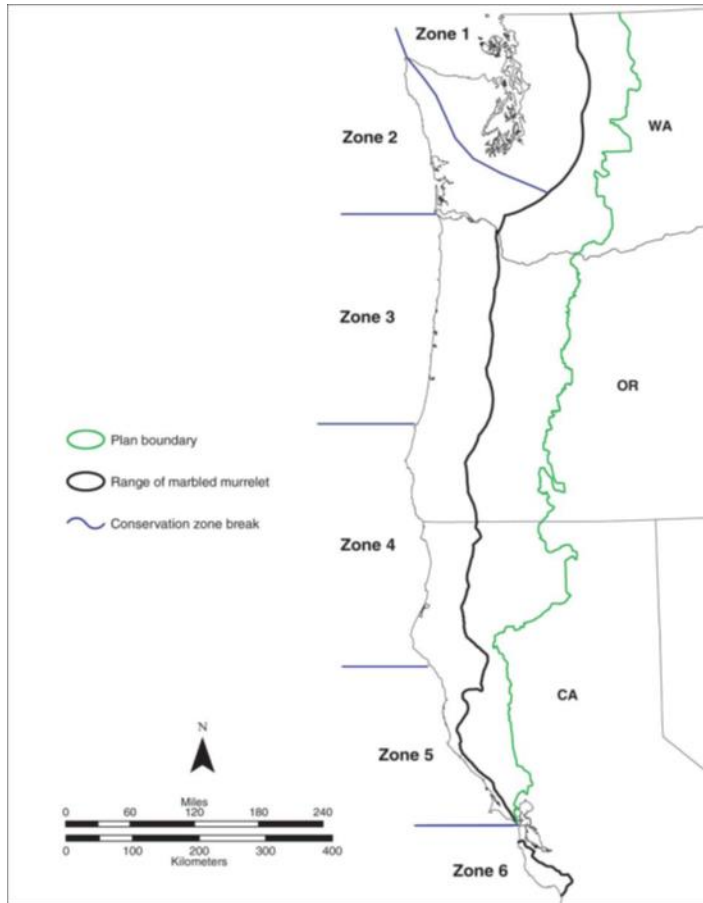
In 2014, there were 179 spotted owl activity centers established where resident single or pair status was determined on the Siskiyou portion of the Rogue River-Siskiyou National Forest in the 20 years since the Siskiyou Forest Plan. Further information pertaining to the action area is described in the Environmental Baseline section below.

## **2.3 Range-wide Status of Marbled Murrelet**

An account of the taxonomy, ecology, and reproductive characteristics of the marbled murrelet can be found in the 2014 species status review (Falxa and Rapheal, 2014 and Lynch, et al. 2017), the final rule designating the species as threatened (USDI Fish and Wildlife Service 1992b), the final rule designating revised critical habitat for the species (USDI Fish and Wildlife Service 2011a), *Ecology and Conservation of the Marbled Murrelet* (Ralph, et al. 1995), and the

*Recovery Plan for the Marbled Murrelet* (USDI Fish and Wildlife Service 1997). A full discussion of the life history of the marbled murrelet and related documents are available on the internet at [http://www.fws.gov/arcata/es/birds/MM/m\\_murrelet.html](http://www.fws.gov/arcata/es/birds/MM/m_murrelet.html).

The recovery plan for the murrelet (USDI FWS 1997) identifies six geographic areas, or “Conservation Zones”. The action area occurs within the Oregon portion of Zone 4, the Siskiyou Coast Range (Figure 1).



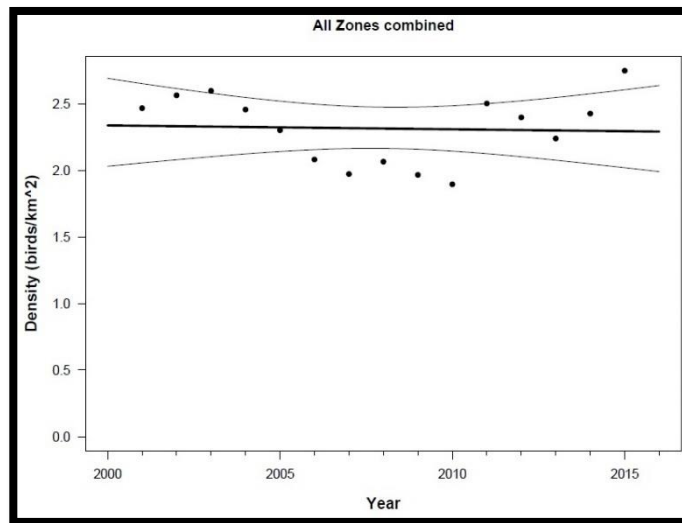
**Figure 1. The six geographic areas identified as Conservation Zones in the recovery plan for the murrelet (USDI FWS 1997). Note: “Plan boundary” refers to the Northwest Forest Plan. Figure adapted from Huff et al. (2006, p. 6).**

Population trend of murrelets is most strongly correlated with trends in nesting habitats, with higher numbers of birds associated with large contiguous patches of suitable nesting habitat (Falxa and Raphael 2016). The Service listed the murrelet as threatened primarily due to range-wide habitat losses. At the time timber harvest had reduced the amount of old growth forest habitat within western Oregon and Washington by more than 80 percent (USDI Fish and Wildlife Service 1992b). At the start of the NWFP, potential habitat was estimated at 2.53 million acres within the murrelet’s range in Washington, Oregon, and California (Falxa and Raphael 2016). Forty-one percent of this habitat occurred on non-federal lands including 44 percent of the highest suitability habitats. Between 1993 and 2012, there was a net loss of 2 percent in potential nesting habitat on federal lands and a 27 percent net loss on non-federal lands (12 percent combined). While fire was the major contributor to habitat loss on federal lands, timber harvest continued to be the primary cause on non-federal lands, suggesting that the

NWFP has been successful in conserving murrelet habitat on federal lands (Falxa and Raphael 2016). Additionally, large amounts of younger forests located within reserve land allocations on federal lands has the potential to offset habitat losses over time as forests mature (Falxa and Raphael 2016).

Within Washington, Oregon, and California, population monitoring from 2000 to 2016 found a declining linear trend in Washington (4.6-percent decline per year) and but no evidence of a trend in Oregon or California; however, in Zone 4 of California, authors reported that the trend estimate was positive, but the evidence for a trend was not conclusive (Falxa et al. 2016) (Figure 2). To date, data do not indicate murrelet populations have stabilized or increased within the NWFP area (Lynch et al. 2017).

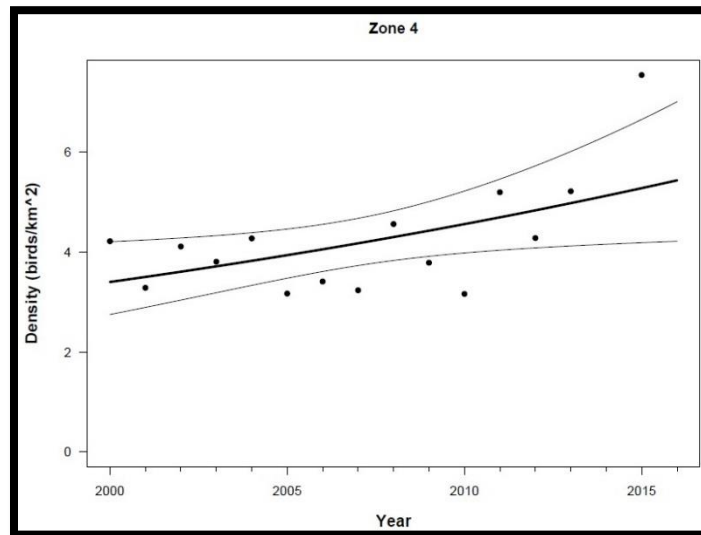
**Figure 2. Murrelet population trend in zones 1 through 5 between 2000 and 2016 (Lynch, et al. 2017)**



The Chetco fire perimeter portion of the action area falls within murrelet recovery conservation zone 4 (Siskiyou Coast Range) (USDI Fish and Wildlife Service 1997). Recovery in this zone is focused on preventing the loss of occupied nesting habitat, minimizing the loss of unoccupied suitable nesting habitat, and decreasing the time for development of new suitable nesting habitat. Population estimates within zone 4 are not available for 2016 but in 2015 were estimated at 8,743 birds (95 percent confidence interval of 7,409 to 13,125) (Lynch, et al. 2017). The population within zone 4 has experienced an annual rate of change since 2000 of +3 percent but with confidence intervals for the estimate overlapping zero, the evidence for a trend was not conclusive, (Figure 3). The overall population rate of change is -0.13 percent.



Figure 3. Murrelet population trend in zone 4 between 2000 and 2016 (Lynch, et al. 2017)



To improve fecundity rates and lessen the impacts from nest predation, the Service states the following in their 2016 report: *Status of the murrelet and its critical habitat*<sup>1</sup>.

*Foremost among the conservation needs are those in the marine and terrestrial environments to increase murrelet fecundity by increasing the number of breeding adults, improving murrelet nest success (due to low nestling survival and low fledging rates), and reducing anthropogenic stressors that reduce individual fitness or lead to mortality.*

*The overall reproductive success (fecundity) of murrelets is directly influenced by nest predation rates (reducing nestling survival rates) in the terrestrial environment and an abundant supply of high quality prey in the marine environment during the breeding season (improving potential nestling survival and fledging rates).*

Per their 2016 report on the status of murrelets<sup>1</sup>, the Service authorized habitat effects on a total of 2,586 acres of suitable habitat in zone 4 between October 1, 2003, and December 12, 2015. Reported habitat effects were 138 acres.

## 2.4 Status of Murrelet Occupancy

The analysis of landscape level protocol surveys which established survey areas A, B, C and D in 2002, incorporated the results of 9,795 surveys conducted between 1988 and 2001 (USDI Fish and Wildlife Service 2002). Statisticians reviewed survey data gathered between 1988 and 1998 and determined data were not a random sample so murrelet occupancy could not be inferred. To create a statistically valid sample, an additional 17 survey sites were surveyed to protocol in 1999 and 2000 within. Ultimately, seven detections occurred within survey area B after 1,472 intensive surveys conducted from 1988 through 2001. One detection occurred in area C after 1,333 surveys, and none occurred in area D after 3,300 surveys. These results were the basis for

<sup>1</sup> USDI Fish & Wildlife Service [no date]. Appendix J: Status of murrelet and its critical habitat. On file with: Rogue River-Siskiyou National Forest, Medford, OR.

establishment of the current survey areas for murrelets (Appendix D Map 13) and were incorporated into the 2003 revision of the murrelet survey protocol (Evans Mack, et al. 2003).

Based on the above analysis, the likelihood of detecting murrelets within survey area B during one survey are less than 0.5 percent (1 in 200 chance). Extrapolating over the 10 surveys required by the protocol, the chance would increase to 4.8 percent (1 in 20 chance) of detecting murrelet presence at any one survey site over two years of surveys. The chance of nesting occurring is even lower since behaviors suggesting nesting were never observed in the 1,472 intensive surveys conducted in survey area B. In summary, nesting within survey area B is highly unlikely.

It is important to note that since the analysis discussed in the baseline section occurred, several occupancy detections have been reported within survey area B. In 1992 and 2009 two occupied sites were established within survey area B as a result of surveys. Both sites are within ½ mile of survey area A, within ¾ mile of each other, and within the upper reaches of Lawson Creek. IN consequence, there may be more murrelet while low in Survey Zone B.

### ***Murrelet Habitat and Occupancy on the Chetco Bar Fire***

A total of 231 occupied murrelet site polygons on the RRSNF encompass 25,309 acres. All sites are on Gold Beach and Powers Ranger Districts. All remaining (post-fire) potentially suitable habitat within the Chetco Bar Fire in survey area A, including occupied areas, is 31,000 acres.

Determining the likelihood of occupancy of murrelets within the Chetco Bar Fire area post-fire occurred in several steps. First, the updated 2017 GNN layer was used to determine the amount of potentially suitable murrelet habitat (using spotted owl NRF as a surrogate) occurring within the fire perimeter and only within 25 miles of the ocean of survey area A (based on data collected from the BLM where occupancy rates dramatically decreased greater than 25 miles from the ocean). This resulted in 23,436 acres of potentially suitable habitat within 25 mile of the coast within the fire area. However, field verification of GNN depicted murrelet habitat for other projects across the Forest have shown that approximately 50 percent of the supposed murrelet habitat does not contain suitable nesting structures for the birds. Therefore, we reduced the amount of suitable murrelet nesting habitat by half for a total of 11,718 acres. The US Fish and Wildlife Service's Oregon coast range wide occupancy analysis and detection rates in a recent Biological Opinion (FWS Reference Number 01EOFW00-2015-F-0279) show that of the potentially suitable habitat on the landscape in Oregon, only 54.8 percent is likely occupied by nesting murrelets within 25 miles from the ocean. Using this estimate, of the 11,718 acres suitable habitat, approximately 6,421 acres is likely occupied by nesting pairs. The above-referenced BO also showed that of the occupied habitat, one pair could be expected for every 55.6 acres of suitable habitat. This gives us an estimate of 115 pairs occurring within the Chetco Bar Fire area and within 25 miles of the ocean in survey area A. Pre-fire, this same analysis shows a total of 158 pairs occupying 8,751 acres within the Chetco Bar Fire area. Therefore, the fire resulted in a loss of habitat affecting 43 pairs.

### 3.0 Description of the Proposed Action

The Proposed Action is to harvest dead, dying or damaged trees on approximately 4,090 acres with 50-100 percent basal area loss within the 191,197-acre Chetco Bar fire.

Dead trees have 100% of the crown burned. To define dying trees, the Forest consulted with a local entomologist to apply guidelines from the *Marking guidelines for fire-injured trees in California* (Smith & Cluck. 2011) for predicting mortality of fire-injured trees (Table 4).

**Table 4. Smith and Cluck predicted mortality rate by species and diameter**

Species	Diameter	Remove trees with % length of crown scorch greater than or equal to:
Ponderosa/Jeffrey Pine	10"-30"	85%
	30"-40"	55%
	40"-50"	35%
Sugar Pine	10"-60"	55%
Incense Cedar	10"-60"	85%
White Firs	10"-35"	80%
	35"-60"	65%
Red Firs	6"-40"	75%
Lodgepole Pine	<10"	5%
	15"-20"	40%
Species	Diameter	Remove trees with volume % of crown scorch greater than or equal to:
Douglas Fir	10"-40"	70%

Trees damaged by the fire may consist of the following situations where the tree has a likely or imminent potential for failure:

- The root system may be damaged by fire; the entire tree may fall.
- The bole may be burned to the extent that portions of it are missing which may cause the bole to break and parts of the tree to fall.
- The limbs may be severely burned making them likely to fall out of the tree.
- Before burning, the tree may have had many conks that indicate severe decay. They may have burned off, eliminating the indicators of root disease or heart rot. The result is that the tree may be more unstable than the visible indicators suggest.

As described in Alternative 2, approximately 46 percent of proposed treatment acres are stands with past timber harvest prior to the fire including clear-cut plantations, shelterwood, pre-commercial thinning, etc. The remaining acres are unmanaged stands with no record of past timber harvest activity.

Logging systems include ground-based (tractor), skyline and helicopter systems. Some activity-created slash would be left for post-harvest soil stability consisting of fine branches, needles, green vegetation (resprouts). Larger down wood would be left to provide additional ground cover, microclimate conditions, and habitat features for plants and wildlife. Slash in excess of cover and down wood requirements for each unit would be piled and burned at landing locations. Connected actions include danger tree abatement on approximately 4.5 miles of maintenance level 1 roads used for access and haul. A 250 foot treatment buffer of either side of the road would be approximately 270 acres. This is in addition to roads treated by the RRSNF Roadside Danger Tree Project. Danger tree felling could also occur near work areas such as landings.

Road maintenance and any necessary reconstruction would occur on system roads used for the project. Approximately 13.5 miles of temporary spur roads would be built then decommissioned following completion of operations. Twelve of those miles are abandoned road templates.

Monitoring revegetation success and planting where appropriate which may include site prep (cutting shrub competition), seedling protection (vexar tubing), and manually planting a mix of site-appropriate tree species.

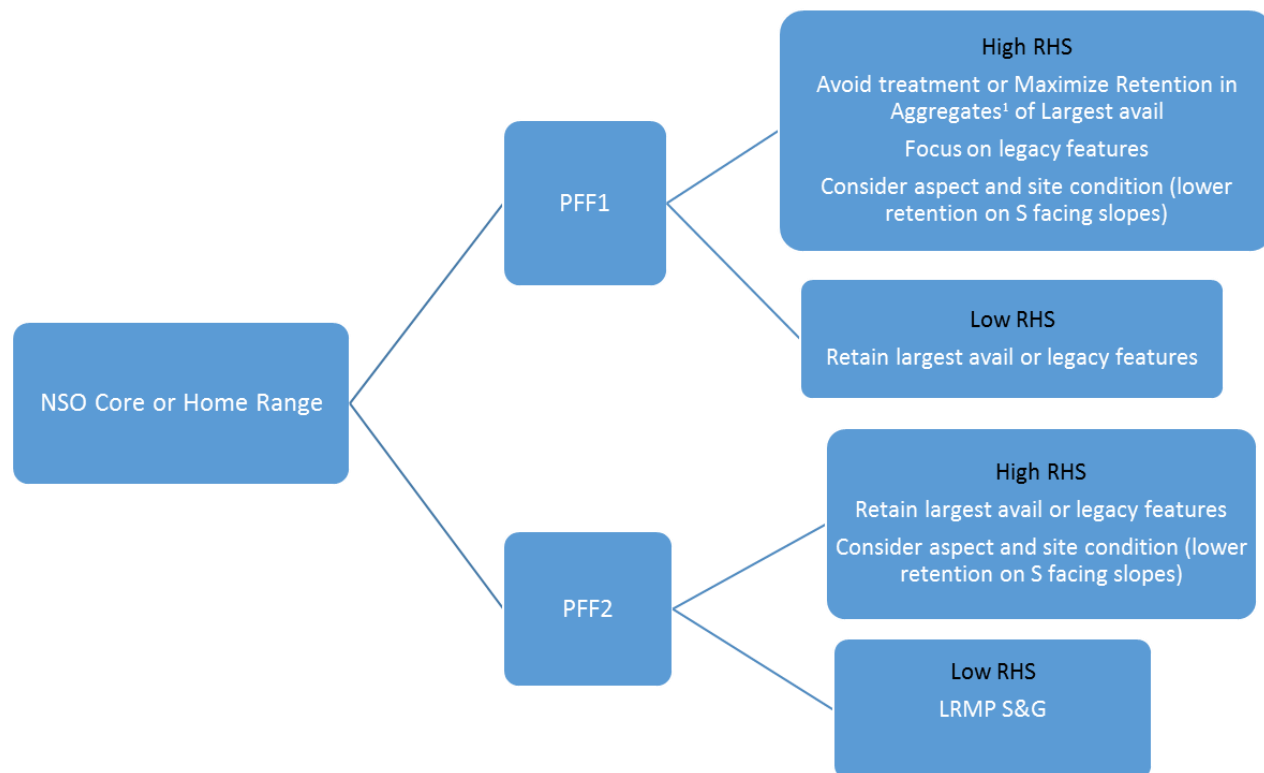
Up to 235 landings (assuming 0.25 acres for ground-based landings and up to 2 acre for helicopter, up to 101 total acres) will be used. No landings would be constructed in NSO nest patches or within NSO NRF or dispersal habitat (appendix A PDC NSO1).

### 3.1 Project Design Criteria and Conservation Measures

Project Design Criteria (PDC) are mandatory conservation measures developed to reduce direct or indirect impacts to listed species (Appendix A). All wildlife PDCs are part of the proposed action and are considered when determining the effects to listed species (Appendix A).

The interagency Level One team jointly developed snag retention measures to reduce the effects of proposed salvage within areas important to spotted owls. The design of the action considered the following hierarchy (Figure 4):

Figure 4



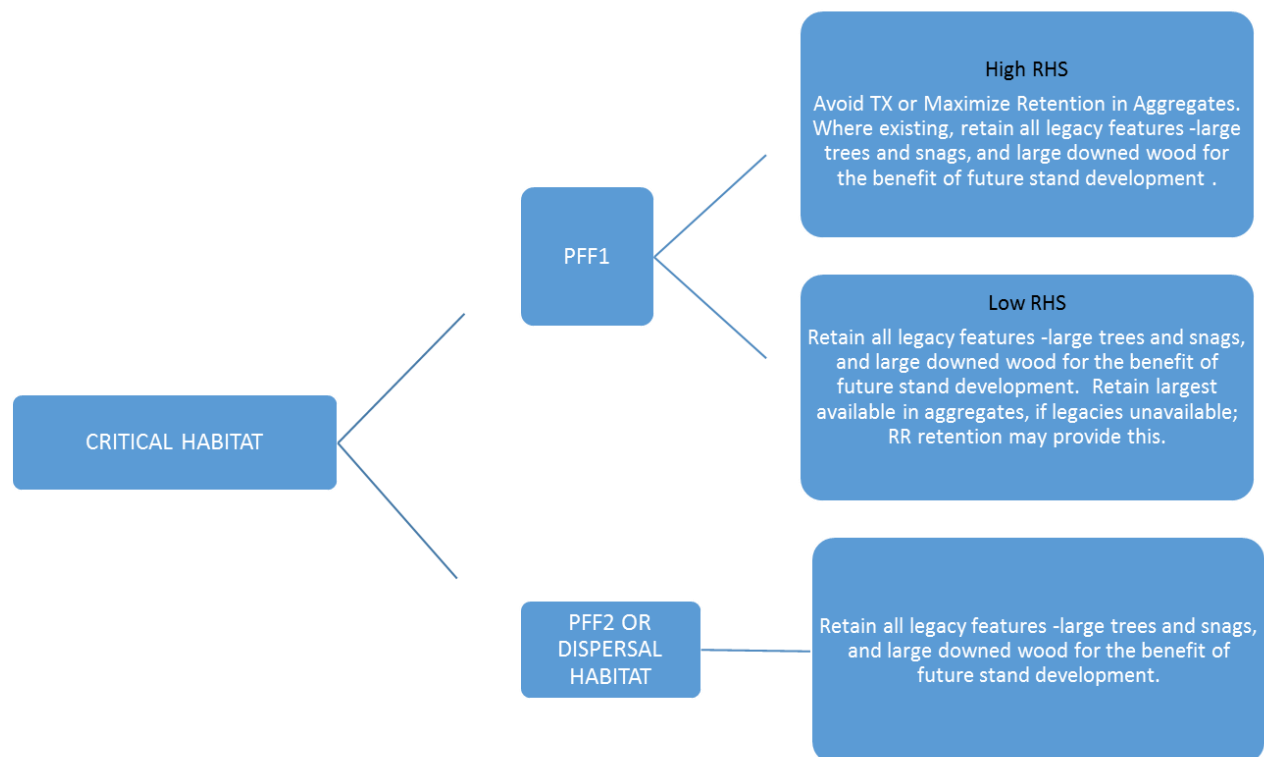
<sup>1</sup>Place aggregates in locations where incidental damage from implementation is minimized. Favorable locations would be lower portions of cable units and/or around unique areas such as rock outcrops, riparian areas/seeps/springs. The intention is minimize the overall size of openings and an increase connectivity of remaining suitable habitat in areas of likely use.

None of the proposed units are in PFF1/High RHS habitat. Only one unit (#137) is within an NSO core area (NSO site# 162) and it is capable habitat.

Eleven units are within NSO home ranges with PFF1/Low RHS habitat:  
35, 90, 107, 157, 163, 165, 180, 170, 104, 160, 156

Thirteen units are within NSO home ranges with PFF2/High RHS habitat:  
48, 53, 55, 56, 104, 116, 117, 118, 119, 121, 122, 123, 180

Snag retention for proposed salvage in PFF habitat outside of NSO core areas or home ranges, but within NSO designated critical habitat would implement the following hierarchy (Figure 5):



**Figure 5**

One unit is within critical habitat with PFF1/Low RHS: 90

One unit is within critical habitat with PFF2/High RHS: 104. Proposed salvage would not occur in habitat classified as dispersal-only.

The remaining units would apply the following retention PDC for snags based on Forest Plan direction and best available science using the Region 6 DecAID advisory tool:

*In order to maintain 30 percent tolerance levels for wildlife that use snags in these matrix stands (outside of northern spotted owl post-fire foraging habitat in NSO core areas, home ranges or*

*critical habitat), project units will retain aggregates and individual snags where feasible to meet 4 snags per acre greater than 10 inches with 2 snags per acre larger than 20 inches dbh where available. These should include hardwoods where available. Snag retention should be a priority near unburned edges, rock outcrops, riparian avoidance areas or remaining individual or clumps of green trees.*

In addition, the following is the retention PDC for down woody debris in all units:

*Desired down wood retention for wildlife is to protect existing large down wood and add wood (including retained snags) to meet the Siskiyou Supplement Standards for tanoak and dry Douglas fir plant series (10 pieces of down wood 20 inches at large end and 20 feet long, 5 pieces of down wood of same size in Douglas-fir series); and add smaller down wood to meet 1.4 percent cover where possible. Down wood retention should be a priority near unburned edges, rock outcrops, riparian avoidance areas or remaining individual or clumps of green trees.*

Disturbance of listed wildlife species occurs when noise, smoke, vibration, or visual stimuli cause impairment of normal behavior. Mandatory PDC designed to avoid potential adverse disturbance effects to nesting birds and their young would be incorporated into all activities integral to the Proposed Action. PDC involving seasonal restrictions would be implemented unless surveys, following approved protocols, indicate either non-occupancy or non-nesting of target species, or as otherwise described. These PDC for disturbance are described in appendix A.

## **4. ENVIRONMENTAL BASELINE**

Regulations implementing Section 7 of the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the Action Area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the Action Area that have undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land management activities.

### **4.1 Description of the Action Area**

The Action Area is defined as *all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action* (50 CFR 402.02). For the purposes of this BA, the Action Area includes all lands managed by the RRSNF. The action area for NSO is different than the action area for marbled murrelet which will be described below.

The action areas are located within the Oregon Klamath province. Harvest history and wildfire have influenced habitat conditions in this province and has played an important role in influencing successional processes and creating diverse forest conditions.

Lower elevations include Oregon white oak woodlands and grasslands, chaparral, scattered ponderosa pine, and Douglas-fir occur up to about 3,500 feet in the interior valleys. Above this is the mixed evergreen zone, dominated with Douglas-fir, incense cedar, tanoak and madrone. Species distribution is influenced by moisture and includes coast hemlock plant associations on moist sites. California chaparral communities can occupy large patches of the landscape, composed primarily of wedge-leaf ceanothus (*Ceanothus cuneatus*) and manzanita

(*Arctostaphylos* species), and a small amount of dry non-conifer balds and pine/oak woodlands are also present.

Spotted owl habitat patterns in these drier portions of its range are not continuous, but occur naturally in a mosaic pattern (USDI FWS 2008). Agee (1993, 2003) and Hessburg and Agee (2003) characterized the historical wildfire regime as low- to mixed-severity with fire return intervals of less than 10 to 50 or more years, depending on local conditions.

Across the RRSNF, little habitat for spotted owls has been downgraded or removed from forest activities; however, it seems that owl numbers continue to decline due to other factors such as barred owls or delayed reaction to past cutting of owl habitats or large fires (Biscuit).

## **4.2 NSO Action Area - Status of Northern Spotted Owl Habitat**

The “action area” analyzed for effects to NSO is a 1.3 mile buffer (provincial home range distance from nest) of proposed salvage units and includes evaluation of the entire home range for owl sites that overlap units and haul routes. The project action area is approximately 76,576 acres.

The environmental baseline for owls on the RRSNF administered lands for the action area is current as of November 2017 (Table 5). This baseline was developed using existing information, field assessments by experienced wildlife biologists, Gradient Nearest Neighbor (GNN) imagery from 2010 (LEMMA OSU), RAVG fire mapping data, as well as and field review and editing from the Level 1 Team and district biologists. These data are also the source of information for other Federal and non-Federal lands.

### *Chetco Bar Fire Effects*

The 2017 Chetco Bar Fire burned 191,197 acres of which over 170,000 acres were national forest system (NFS) lands. Burn severity was variable with approximately 93,390 acres of 50-100% basal area loss (49% of the entire fire).

On RRSNF lands, fire suppression impacts to vegetation cover such as staging areas, dozer and handline, is included in the imagery gathered for the RAVG mapping which was used for this analysis.

### *Chetco Bar Fire within the Action Area*

Approximately 49 percent of the action area burned with more than 50% basal area loss which means 51 percent of the action area had less than 50% basal area loss or was unburned. In fact, 3 percent of the action area is completely outside of the fire perimeter.

An estimated 8,161 acres of NRF burned at moderate and high severity and about 19,020 acres of NRF remain within the 76,576 acre action area (about 25 percent) (Table 9).

Table 5. Environmental Baseline for the Action Area.

Habitat on All Ownerships within the NSO Action Area.								
Owner	NRF		Capable		Dispersal Only		PFF	
NWFP Reserved or Not	not reserved	Reserved	not reserved	Reserved	not reserved	Reserved	not reserved	Reserved
BLM	275	78	1,298	14	340	57	144	0
PV	1,318	0	5,239	0	3,121	0	600	0
USFS	6,550	10,799	12,665	11,903	4,820	6,609	3,207	4,210
Grand Total	8,143	10,877	19,202	11,917	8,281	6,666	3,951	4,210
Spotted Owl Critical Habitat								
Critical Habitat Unit	Total Acres	Total NRF Habitat Acres (%)	Capable	NRF RESERVED	NON-RESERVED NRF	ALL DISPERSAL	PFF	
UNIT 9 Total	663,250	287,181 (44%)	96,012 (15%)	374,466 (56%)	288,783 (44%)	416,471 (63%)	5,692 (8%)	
SUBUNIT	Total Acres	Total NRF Acres (%)	NRF Acres in Action Area	Reserved NRF in Action Ares	Non-Reserved NRF in Action Area	All Dispersal in Action Area	PFF in Action Area	
9 KLW 3 RRSNF	139,349	67,621(48%)	8,810 (6%)	7,014 (80%)	1,796 (20%)	13,955 (10%)	3,734 (2%)	
Notes: <sup>1</sup> Reserved= land allocation with no programmed timber harvest which includes Administratively Withdrawn, Congressionally Reserved, LSR's, Owl Cores and Wild and Scenic River Corridors. Capable Habitat: forestland that is currently not habitat but can become NRF or dispersal in the future, as trees mature and the canopy closes.								

### Northern Spotted Owl Dispersal Habitat

The proposed action is entirely within the Chetco-South Coast section 7 watershed (major sub-basin) on the RRSNF. There are 53 known (historic) owl sites on RRSNF lands in this section 7 watershed. Table 6 shows the current habitat baseline for the Chetco-South Coast section seven watershed which is currently just below 50 percent in all dispersal.

Table 6. Section 7 Watershed Baseline

Section 7 watershed	Capable	Dispersal-Only	Non-Forest	NRF	PFF	All Dispersal (percent of watershed)	Grand Total
Chetco-South Coast	81,411	68,016	41,541	60,364	10,630	128,380 (49%)	261,962



## Unsurveyed Suitable Habitat in the Action Area

Since there have been no protocol surveys on RRSNF for many years and it's possible that owls in sites that burned extensively have shifted their location, Table 7 displays acres of existing NRF habitat by relative habitat suitability for all RRSNF managed lands within the Action Area.

**Table 7. Unsurveyed suitable habitat on RRSNF managed lands within the Action Area**

Habitat	NFS Acres	BLM Acres	Total
NRF High	9,017	296	9,313
NRF Low	8,332	56	8,388
<b>Total NRF</b>	<b>17,349</b>	<b>352</b>	<b>17,701</b>
PFF1 High	2,714	10	2,724
PFF1 Low	925	9	934
<b>Total PFF1</b>	<b>3,639</b>	<b>19</b>	<b>3,658</b>
PFF2 High	1,037	16	1,053
PFF2 Low	2,741	108	2,849
<b>Total PFF2</b>	<b>3,778</b>	<b>124</b>	<b>3,902</b>
<b>Grand Total</b>	<b>24,766</b>	<b>495</b>	<b>25,261</b>

## 4.3 Status of Northern Spotted Owl Sites in the Action Area

The action area includes thirteen NSO site locations based on historic information, protocol surveys, or incidental observations (appendix C maps 1, 2 and 3). Appendix B, Table B-1 displays the amounts of NRF and PFF habitats for the nest patch, core area and home range of these sites. These amounts account for PFF removed by the Chetco Bar Danger Tree Abatement project covered by a separate consultation. None have 50 percent or more NRF in the core area, or 40 percent or more NRF in the home range.

Most surveys were conducted between 1989 and 1993, so history of occupancy is lacking for the last 25 years (Appendix B, Table B-2). Only one site (102) had confirmed nesting status in the last 25 years. NSO surveys are underway for the 2018 nesting season.

Since existing survey coverage and effort are insufficient to produce reliable range-wide estimates of population size, demographic data are used to evaluate trends in spotted owl populations. The previous discussion of recent demographic study area data regarding individual and pair occupancy has shown a steady and rapid decline (section 2.1, Lesmeister et al. 2017), which suggests the stability of the population across the action area may be in question.

## 4.4 Spotted Owl Prey Species

The northern flying squirrel, red tree vole, dusky-footed woodrat, and bushy-tailed woodrat are important prey of the northern spotted owl in this action area. In the Southern Oregon Cascades Demographic Study Area, 6,109 prey specimens from 130 owl sites in regurgitated pellets were collected and identified during 2000 to 2010. Samples were collected opportunistically at spotted owl nesting or roosting sites with most pellets collected from breeding spotted owls. The sample consists primarily of northern flying squirrels (*Glaucomys sabrinus*), woodrat species (*Neotoma* spp.), and lagomorphs [snowshoe hares (*Lepus americanus*) and brush rabbits (*Sylvilagus bachmani*)] (Dugger et al. 2012). Pocket gophers, red-backed voles, and moles in pellets were lower in biomass but higher in absolute numbers (Dugger et al. 2012).

Lagomorph populations across their range are cyclic to some degree. In the Southern Oregon Cascades Demographic Study, Dugger et al. (2010) reported that the proportion of pairs that attempt to nest each year was positively associated with the biomass proportion of lagomorphs. Martin and McComb (2002) noted that small mammal diversity in the Coast Range matched the intermediate disturbance hypothesis (IDH): a combination of both early- and late-successional conditions produced highest small mammal diversity.

The action area provides habitats for both bushy-tailed woodrats (*Neotoma cinerea*) and dusky-footed woodrats (*N. fuscipes*). Both of these species use small-diameter woody material for building nests which may be constructed either on the ground or in trees. Both species also forage on shrubs, forbs, grasses, and parts of conifers. Bushy-tailed woodrats are more associated with vegetative cover and food availability than on seral stage and often use areas previously disturbed by fire (Carey 1991). Bushy-tailed woodrats are most abundant along streams, and riparian areas may serve as the principal avenue for woodrat recolonization (Dugger et al 2015). In southwest Oregon, bushy-tailed woodrats (n=6) were outfitted with radio collars as part of the monitoring effort for the Ashland Forest Resiliency project. As of this writing, all of these individuals are arboreal and have been using cavities in snags or live trees for rest sites. While some of this habitat was certainly lost from the high severity fire, it is expected that additional snag cavity habitats will eventually be created as a result of these fires.

Lagomorphs are also a prey component of the NSO. Both brush rabbits and snowshoe hares prefer habitats with dense understories interspersed with open foraging areas where grasses and forbs are available. It is likely that the 2017 fires reduced this type of habitat within the action area; however, these shrub and herbaceous habitats in mixed conifer habitat types re-establish quickly after fires (Lentile et al 2007, Donato et al 2008).

Flying squirrel densities are correlated with complex conifer habitats, high cavity density, large amounts of hypogeous fungi, and crown class differentiation (Carey et al 1999, Carey et al 2000). Moderate-and high severity fires can negatively influence important elements of flying squirrel habitat (stand density, overstory canopy cover, mid-story structure, understory vegetation diversity, dead and down wood, defective trees, truffle and lichen biomass, canopy cover and litter). At the scale observed in the action area of these effects, it is assumed flying squirrel populations were negatively impacted.

The red tree vole (RTV) is a relatively common prey species for spotted owls in particular on the coast where they are numerous. It is likely that six known RTV sites were lost among an unknown number of others in the Chetco fire which could adversely affect the ability for owls to forage for that species. For information on the “Natural History” of the red tree vole, please see the recently completed “Survey Protocol for the Red Tree Vole, Version 3.0”, available at: <http://www.blm.gov/or/plans/surveyandmanage/files/sp-RedTreeVole-v3-0-2012-11.pdf>.

### **Effects to Prey from Fire**

Natural disturbance processes such as wildfire, disease, insect outbreaks and windthrow are important forces that influence spotted owl habitat (USDA Fish and Wildlife Service, 2011). Decades of fire suppression in western North American forests have greatly increased understory fuels, amplified the frequency of high-intensity catastrophic fires and substantially changed forest stand composition and structure (Agee, 1993).

In general, the immediate and obvious direct effects of fire on wildlife are fire-caused mortality, emigration, and immigration. Our anthropocentric view of the world leads to a common expectation that animals will display widespread panic in the face of fire. While some animals invariably are killed by the flaming front, observations made in the vicinity of advancing fire fronts across many ecosystems and continents present a different picture. Large, mobile mammals such as ungulates and adult birds are capable of moving quickly to unburned refugia through fire breaks to relatively safe, unburned ground. For example, Clark (2007) documented postfire movements of radio-tagged northern spotted owls from their burned territories into adjacent, unburned areas. There also are reports (Quinn 1994; Russell et al. 1999; Smith 2000; Yager et al. 2007) of many smaller, less mobile organisms (e.g., small reptiles and frogs) seeking out and surviving in burrows and crevices. Observations such as these imply that animals were able to seek out unburned refugia. Another explanation is that all animals were killed except those within the patches of vegetation, woody debris, or burrows that escaped the fire. However, few studies have tried to determine whether refugia hold a concentration of animals post-fire or are simply just a remnant population at the original densities (Whelan 1995). In addition, demographic estimates associated with fire rarely separate direct mortality from indirect mortality (i.e., mortality due to habitat modification; so it is not clear whether fire per se is a serious cause of mortality in wildlife. But current information suggests fire in general has little direct effect on most wildlife species (Russell et al. 1999; Smith 2000).

Spotted owl prey may be more exposed in the area disturbed by fire or may move away from the area for the short-term. Some minor changes in prey availability may occur as cover is disturbed or removed and animals move around in the understory. Increased exposure may make prey more vulnerable which would improve foraging for NSO, however disturbed areas might attract other predators such as hawks, other owls, and mammalian predators which may increase competition for NSO in the area.

Depending on the pattern, scope and scale of a fire, some disturbance of dispersal habitat may improve forage conditions, provided that understory structure and cover are retained. Removal of some tree canopy, provided it is not too extreme, will bring more light and resources into the stand, stimulating forbs, shrubs and other prey food. Canopy simplification can increase vulnerability to predation. Once the initial impact of disturbance recovers (6 months to 2 years), the understory habitat conditions for prey food would increase over the next few years, until shrubs and residual trees respond and once again close in the stand.

In summary, it is likely that widespread reductions of multi canopy from moderate and high severity fire likely negatively affected spotted owl prey in the action area. The loss of mid- and overstory cover limits prey movement and can increase the susceptibilities to predators. Additionally, high severity fires, especially within large patches, can radically alter microsite conditions associated with ectomycorrhizal fungi and fruiting bodies flying squirrels they forage on. Combined, these impacts to localized prey populations likely will effect demographic conditions of resident owls, at least in the short term.

#### **4.5 Status of Northern Spotted Owl Critical Habitat in the Action Area**

The action area is within subunit K LW-3 of critical habitat unit 9. RRSNF lands within the action area include approximately 28,000 acres (20%) of K LW-3. Table 8 displays existing habitat within the portion of K LW3 in the action area. Current amounts of available habitat account for PFF removed by the RRSNF 2017 Danger Tree Abatement project.

**Table 8. Current habitat within KLV3 on RRSNF in the Action Area**

Subunit	Capable	Dispersal-only	Non-Forest	NRF/High RHS	NRF/Low RHS	PFF1 <sup>1</sup>	PFF2
KLV 3	9,731	5,140	595	6,467	2,342	2,622	1,112

<sup>1</sup>PFF1 is within 500 ft of NRF/High RHS; PFF2 is beyond 500ft of NRF/High RHS

## 4.6 Status of Habitat in the Marbled Murrelet Action Area

### Action Area

Murrelets have different habitat requirements than NSO, therefore the marbled murrelet action area is defined differently. For this analysis, the habitat directly or indirectly affected by the proposed actions for the murrelet includes the proposed salvage units buffered by 400 feet for edge effects (approximately 120m), landings, temporary roads, and danger tree treatments on haul routes outside of the RRSNF Danger Tree Abatement project. In addition a 120 foot buffer of all haul routes would identify potential disturbance that may occur outside of the areas identified with the 400 foot buffer. This action area is approximately 15,025 acres (Table 9, appendix C, maps 4 and 5).

Table 13 displays the ownership and potential habitat for marbled murrelet (NRF) within the action area. Habitat classified as NRF (based on the GNN habitat data) is used as a surrogate for marbled murrelet habitat. Because suitable nesting structures do not occur broadly across this habitat type, these acres likely overestimate suitable habitat for marbled murrelet; as such the roughly 2,727 acres of NRF represents about 18 percent of the marbled murrelet action area.

**Table 9. Marbled Murrelet Action Area acres by ownership.**

Owner	AA Acres	Acres NRF
RRSNF	14,606	2,727
BLM	91	9
Private	328	32
Total	15,025	2,768

## 4.7 Status of Marbled Murrelet Occupancy in the Action Area

Approximately 650 acres within 9 individual patches of occupied habitat are directly adjacent to or overlap the action area. Of these, 9.6 acres that burned at moderate or high severity overlap four of the proposed units (appendix C, map 4). This habitat is no longer considered suitable for marbled murrelet. Surveys for marbled murrelet have not been conducted for several years, therefore suitable habitat is considered occupied for the purpose of this analysis.

## 4.8 Status of Murrelet Critical Habitat in the Action Area

Table 10 displays post-fire potential marbled murrelet habitat within the Chetco-South Coast section seven watershed based on NSO NRF habitat.

**Table 10. Murrelet habitat baseline and ownership by section 7 watershed.**

Section 7 Watershed	Sec. 7 Watershed - All Owners Post-fire Acres	Sec. 7 in Federal Ownership <sup>1</sup> Post-fire Acres (%)	Sec. 7 in Non-federal Ownership Post-fire Acres (%)	Murrelet Suitable Habitat <sup>1</sup> (Fed. Only) Post-fire Acres (% Fed.)
Chetco South Coast	405,307	268,963 (66%)	136,344 (34%)	64,150 (24%)
<sup>1</sup> Spotted owl NRF used as a surrogate for murrelet suitable habitat which may substantially overestimate actual MAMU Habitat.				

Table 11 shows the effects of the Chetco Bar Fire on habitat within designated Murrelet Critical Habitat. Approximately 3,838 acres of suitable habitat burned at moderate and high severity within two murrelet critical habitat units in the Chetco Bar Fire. This loss of habitat, according to the Forest's occupancy analysis described in section 2.4, may have impacted up to 69 pairs of murrelets within critical habitat.

**Table 11. Current Condition of Marbled Murrelet Designated Critical Habitat**

	Total CHU acres <sup>1</sup>	Total CHU acres within fire perimeter	Pre-fire habitat (acres)	Post-fire habitat (acres)	Habitat Loss (acres)
OR-07-c	28,055	22,239	7,590	6,188	1,402
OR-07-d	84,914	26,801	31,453	28,917	2,536
Totals	112,969	49,040	39,391	34,805	3,838

### Habitat in Murrelet Survey Areas

On Federal lands under the NWFP, surveys are required for all timber sales that remove murrelet habitat in survey zone areas A and B.

Survey area A was established based on a line which follows the western hemlock/tanoak vegetative zone. The boundary for survey area A follows along that vegetative zone and its boundary with the mixed conifer/evergreen zone to the east. Survey area B is a 10 kilometer (6.5 mile) buffer of survey area A. The Chetco Bar Fire area is within Conservation Zone 4, of which the majority is encompassed by survey zone A (410,167 acres).

Prior to the Chetco Bar Fire, the only data available to estimate suitable murrelet habitat was the 2012 gradient nearest neighbor (GNN) dataset developed by Oregon State University (<http://www.fsl.orst.edu/lemma/>), which differentiated spotted owl habitat into NRF, dispersal, capable and non-habitat. NRF was used as a surrogate for murrelet nesting habitat and recognized to significantly overestimate actual habitat by a factor of four or more. This habitat is considered potentially suitable until field reviews for projects are conducted. This 2012 GNN data was then updated with the Chetco Bar Fire severity mapping and field reviews for spotted owl NRF and actual marbled murrelet habitat. Approximately 172,000 acres of suitable marbled murrelet habitat occurred on the RRSNF pre-fire. Approximately 39,384 acres are still extant

marbled murrelet habitat within the fire perimeter. 28,595 acres are suitable habitat for marbled murrelet in Survey Zone A, and 10,789 on Survey Zone B.

Approximately 596 acres of two marbled murrelet designated critical habitat units are within the action area (appendix C, maps 4 and 5). These acres are primarily within the buffers for indirect effects (edge effect and disturbance) of the units and haul routes. Of those, an estimated 477 acres are potentially suitable for murrelet habitat (Table 12) and are entirely on RRSNF lands.

**Table 12. Current Condition of Designated Critical Habitat within the Action Area**

MAMU CHU	Total CHU Acres	Total Suitable Acres in CHU	Total acres in Action Area	Suitable Acres in Action Area
OR-07-c*	28,055	9,458	1,170	244
OR-07-d*	84,914	35,958	761	233
<b>Total</b>	<b>112,969</b>	<b>45,416</b>	<b>1,931</b>	<b>477</b>

## 5. Effects of the Proposed Action

The following mechanisms for effects of the proposed 4,090 acres of fire salvage and connected actions were used to determine effects to the marbled murrelet and northern spotted owl.

### Mechanisms for Effects

- **Cutting and yarding activities**
  - Edge effects / disturbance of adjacent living vegetation
  - Incidental damage or destruction of snags and existing down wood
  - Felling and removal of existing snag habitat
  - Direct mortality from equipment, snag felling and yarding.
  - Noise disturbance.
- **Pile burning**
  - Smoke disturbance during breeding season.
  - Direct mortality from burning (possibly prey spp. habitat)
  - + Reduced fuel loading
- **Temporary road and landing construction or reconstruction**
  - Localized habitat removal/modification
  - Noise disturbance
- **Hauling of removed material**
  - Noise disturbance
- **Revegetation site prep and planting**
  - Localized habitat disturbance, removal, or modification

### 5.1 Effects to Marbled Murrelet Habitat

None of the proposed activities would directly modify or remove existing suitable habitat for marbled murrelet. A total of 9.6 acres of burned occupied habitat (ranging in scale from 0.5 to 5 acres) overlap proposed units #147, 149, 160 and 165. Three acres of unit 147 is within the RRSNF Roadside Danger Tree Project buffer. These portions of occupied habitat burned with moderate to high severity and no longer provide suitable habitat for marbled murrelet.

Salvage harvest of large legacy trees directly adjacent to potential suitable habitat for marbled murrelet could increase sun and wind exposure for a nest if located within a tree-height of a nest tree. Studies of edge effects from clear cuts into forested stands suggest that effects including increased understory vegetation growth and wind throw can be measured up to approximately 120 meters (393 feet) into the forested stand. Wind throw would be more likely for large trees that have weakened roots and/or reduced soil stability (Burton 2002, Ruel 1995). Suitable marbled murrelet habitat (NRF) within 400 feet of the proposed units was identified for potential edge effects. Twenty-six proposed units with low RHS PFF1 or scattered large legacy snags that did not meet the 40% canopy cover criteria for PFF, could have burnt legacy snags adjacent to existing marbled murrelet habitat (NRF, appendix C map 5). The amount of edge these units share with potential marbled murrelet habitat varies from 50 to 1500 feet and could affect up to 230 acres of suitable habitat. Project design criteria to protect live legacy trees with potential structure for nest habitat with a 70 foot no-treat buffer including those directly adjacent to salvage units would minimize potential for increased exposure of potential nest trees. This would be implemented for the following units adjacent to occupied habitat: 147, 148, 167, and 159.

The following units would also be field checked for suitable nest trees adjacent to legacy snags where this PDC would also apply: 25, 29, 49, 53, 55, 58, 69, 99, 100, 103, 106, 107, 127, 132, 140, 141, 155, 157, 160, 168, 169, and 170. (Appendix A, PDC MAMU1)

The proposed Chetco Bar Fire Salvage Project is not expected to substantially modify suitable murrelet habitat.

### **5.1.2 Effects to Marbled Murrelet Critical Habitat**

None of the proposed units or temporary roads are within critical habitat for marbled murrelet. Three proposed landing locations may occur within critical habitat, two of which may be helicopter landings. These landings will be located directly adjacent to roads in burned areas that do not provide suitable habitat for marbled murrelet. Approximately 24 acres of potential danger tree treatment on maintenance level 1 road would occur within critical habitat but would not affect any suitable habitat. Therefore, the proposed Chetco Bar Fire Salvage Project is not expected to affect PBFs within designated critical habitat for marbled murrelet.

### **5.1.3 Marbled Murrelet Disturbance and Disruption**

Activities that produce noise above ambient levels during the critical breeding period could disturb or disrupt breeding marbled murrelets. The project would restrict salvage cutting, temp road construction and danger tree abatement on maintenance level 1 and 2 haul routes adjacent to suitable or occupied habitat to minimize or avoid disturbance to marbled murrelets during the critical breeding season (appendix A, PDC MAMU2).

Haul on maintenance level 3, 4 or 5 (high use) roads is not expected to disturb murrelets due to the normal amount of public use on these roads and would not be restricted.

Approximately 360 acres of potentially suitable habitat for marbled murrelet occurs within disturbance distances of the following maintenance level 1 and 2 roads proposed for haul with two exceptions described below (appendix A, PDC MAMU2 and Table A-2):

1170-540, 1407-130, 1407-133, 1407-136, 1909-120, 1917-125.

Haul would be restricted on all of these roads from April 1 until August 5 of any year, after which operations would not occur 2 hours after sunrise or two hours before sunset until September 15, with the following exceptions: haul may occur on *FSR 1407-150 and 1917-060* after June 30, however, daily restrictions (2 hours after sunrise and 2 hours before sunset) would still apply (appendix C, map 6 and 7).

Therefore, this potential disruption by road haul **may affect, likely to adversely affect** breeding murrelets on up to 11 acres of habitat at these locations on these L2 less-traveled roads of proposed haul. These 11 acres are the same acres of disruption identified in the RRSNF danger tree abatement consultation. All other activities that produce noise above ambient levels would be restricted during the critical breeding season.

#### **5.1.4 Interrelated and Interdependent Effects**

Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that might occur independently of the larger action, but have no independent utility apart from the action under consideration. Interdependent actions depend on the Federal action and would make no sense without it.

All proposed activities in this BA have interrelated and interdependent effects, such as noise, road construction or hauling on existing system roads, and post-treatment slash disposal. Slash disposal activities vary according to conditions post-treatment, fuels management objectives, requirements for retention of down woody material, and other resource management goals. Post project fuels reduction includes biomass removal, pile burning; and rearranging fuels by crushing, mulching, and lopping and scattering.

#### **5.1.5 Cumulative Effects Marbled Murrelets**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. The majority of the suitable marbled murrelet habitat within survey zone A on the RRSNF is within FS ownership, so few future non-federal actions would occur that could affect suitable habitat. State or tribal lands do not occur in the action area. The 258 acres of non-federal lands within the Project action area are predominately industrial timber lands. This watershed has a long history of timber management on non-federal lands so there is very little suitable murrelet habitat remaining. An estimated 15 acres of NRF occur on those non-federal lands where murrelet occupancy is not likely to occur. Additionally, ongoing salvage harvest and associated disturbance on those lands likely has precluded any adjacent murrelet nesting. Known future non-federal actions include reforestation activities typical on private lands such as controlling non-merchantable trees and shrubs with herbicide, tree planting and fertilization followed by future commercial harvest.

#### **5.1.6 Consistency with Marbled Murrelet Recovery Plan**

**One of the Primary recovery items identified in the Murrelet Recovery Plan is to protect terrestrial habitat essential for marbled murrelet recovery.**

Marbled murrelet population trends have led the U.S. Fish and Wildlife Service to conclude that a number of areas, including nesting areas and feeding sites well-distributed throughout its terrestrial and marine range, are essential to the conservation of the species. Late-Successional



Reserves, as described in the Forest Plan together with the final rule designating critical habitat for marbled murrelets, will eventually contribute to recovery” (USDI FWS 1997).

While the Chetco Bar fire reduced suitable murrelet habitat described previously, the proposed action is not expected to result in substantial effects to suitable habitat for marbled murrelet. The 2017 fires changed this landscape by removing and delaying the development of suitable murrelet habitat; however, the Forest has determined that the proposed action is not likely to exacerbate these effects or preclude the continued conservation and recovery of the species within Conservation Zone 4.

## **5.2 Effects to Northern Spotted Owl Habitat**

Proposed salvage harvest and associated activities would occur on approximately 4,462 acres within the action area, affecting about 921 acres of NRF that burned at high and moderate severity (PFF) (Table 13). The majority of salvage treatments (about 600 acres) occur in areas that are less likely to be used by spotted owls because they are beyond 500 feet of high RHS NRF habitat and in areas not favored for nesting/roosting or foraging by spotted owls. The 4,090 acres of proposed salvage harvest units would need approximately 13.5 miles of temporary road construction. The effects of temporary road construction within the units is included with the acres of harvest due to the intensity of proposed harvest. Approximately 3.5 miles of temporary road construction would occur outside of harvest units and include small patches of PFF and NRF. As mentioned previously most of these are abandoned road templates and that would be opened for project operations, then rehabilitated post-project. Landings for ground-based yarding are generally 0.25 acres or less, helicopter landings range from 1-2 acres and 2 landings are needed for each area of helicopter yarding. Approximately 24 helicopter landings and 211 cable or tractor landings are proposed for the project. These will be located at old landing locations or incorporate wide areas along roads or other burned non-habitat areas. Only one ground-based landing is proposed within low RHS PFF2 along a proposed temporary road, the rest would be in capable or non-forest. Approximately 4.5 miles of haul routes on maintenance level 2 roads would need danger tree treatment (these routes are not included in the RRSNF 2017 Danger Tree Abatement Project.)

**Table 13. Spotted Owl Habitats within Proposed Chetco Bar Fire Area Salvage Activities.**

Activity	Non-Forest	Capable	Dispersal	NRF	PFF1/High RHS	PFF1/Low RHS	PFF2/High RHS	PFF2/Low RHS	Total
Salvage Units	4	3,217	0	0	0	135	133	601	4,090
Landing construction	0	100.5	0	0	0	0	0	0.25	101
Temp road construction (13.5 mi)	<1	2	1	<1	<1	<1	<1	<1	5
Haul Rte Danger Tree Abatement <sup>1</sup>	13	183	12	12	3	0	11	37	271
<b>Grand Total</b>	<b>18</b>	<b>3,502.5</b>	<b>13</b>	<b>12</b>	<b>3</b>	<b>135</b>	<b>145</b>	<b>638</b>	<b>4,467</b>

<sup>1</sup> This is in addition to the RRSNF Danger Tree Abatement project.

The evaluation below describes the general effects to the habitat from the proposed actions listed above. The determinations are based on activities in NRF or dispersal, PFF removal, and potential for disturbance during the breeding season. These general effect determinations serve as a starting point for the more detailed analysis for effects to each NSO site within the Action Area and for effects to critical habitat.

## Direct Effects to Habitat

### Post-fire foraging

PFF characterizes habitats classified as NRF that burned at moderate and high severity. The degree to which NSOs use PFF (and therefore the effects of removal) is influenced by a complex array of factors, including the availability and distribution of existing spotted owl habitat, locations of activity centers, burn severities and scales burned habitats. This analysis includes evaluation of primary PFF (PFF1) which is within 500ft of NRF with High RHS and secondary PFF (PFF2) which is beyond 500ft of such NRF.

Salvage harvest would result in large openings in the canopy that will persist over the long term. The objective of PDCs to retain large legacy snags within PFF habitats is to provide some habitat structure and minimize the contrast of the opening with the surrounding habitat. Nonetheless, salvage harvest in PFF habitat is expected to reduce the likelihood that owls would use it for foraging and therefore it would no longer be considered PFF post-harvest. Danger tree abatement along haul routes in PFF habitat would have the same result.

At this scale, and we have determined that the removal of up to 921 acres of PFF habitat is not insignificant or discountable. Of these, approximately 783 are PFF2 which is less likely to be used by NSO. However, 135 acres of PFF1 may continue to be utilized by spotted owls to some degree, and the potential for large openings throughout the action area is long-lasting.

### NRF or Dispersal

Proposed danger tree treatments in NRF and Dispersal habitats would fell and leave snags that meet the definition of roadside danger trees within these habitats. Since these are small acreages at the edges of larger patches of these habitats or burned areas, danger tree treatments would not change the local functionality of these habitats. Likewise, the amounts of NRF and dispersal that

would possibly be modified for temporary road construction are very small and not expected to change the local functionality of that habitat.

## **5.2.1 Effects to Spotted Owl Sites**

### **Analysis Methods**

Owl sites are analyzed at the nest patch, core area, and provincial home range scales. PDCs would be applied to all sites within or adjacent to project units and other activities to reduce or eliminate impacts to owl sites. Proposed salvage harvest would remove PFF. NRF habitat will not be downgraded or removed, nor will dispersal-only habitat be removed. Therefore, the NRF thresholds at the nest patch, core area, and home range scales would not be reduced except for the removal of PFF which is considered suitable for foraging or roosting in the short term.

The analysis of effects to individual spotted owls incorporates the amount and juxtaposition of harvest in PFF habitat to existing NRF, spotted owl nest patches, cores areas, and home ranges. It also incorporates the Relative Habitat Suitability (RHS) Model developed by the US Fish and Wildlife Service in its current Spotted Owl Recovery Plan (FWS 2011, Appendix C) whereby authors found strong selection against habitats classified as low RHS. Given those findings, and for the purposes of this analysis, we assume that in areas or habitats (NRF/PFF) identified as low RHS, there is a very low potential for spotted owls to use these habitats for nesting. They may roost or forage in these habitats (depending on proximity to high RHS NRF) but they are unlikely to select these areas for nesting. Areas identified as low RHS in the Klamath province are generally on or near primary ridgetops, southerly tending slopes and in habitat not likely to support nesting and roosting habitats.

Depending on the scale, significant changes to stand structure and habitats likely used by NSO for at least foraging, could occur from harvest in PFF habitat. Effects would not be considered insignificant when PFF is removed in high RHS, within nest patch or core areas, or if a significant amount of PFF will be removed relative to the amount of NRF in a spotted owl site. Effects are expected to be insignificant to a site when they are very small isolated amounts or distributed within in a home range such that it would not preclude or reduce the function of that site to persist. The thirteen historic NSO sites in the action area will be monitored during the 2018 calling season.

### **Nest patch and core areas**

Appendix B Table B-1 displays existing habitat within each nest patch, core area, and home range for the 13 sites in the action area. In addition, it displays the PFF habitat be removed or modified to the extent that it would no longer function as PFF.

No harvest units, landings, danger tree abatement or temporary road construction would occur within any nest patch. One core area (site 162) has a portion of proposed salvage unit (#137) within it which is 9 acres of capable habitat. No landings, roadside danger tree treatments or temporary road construction would occur in any core areas. Therefore, proposed activities would not affect suitable NSO habitat within any core areas.

### **Home Ranges**

Table B-1 displays the amounts of PFF habitat that would be removed by the project within each home range. Of the thirteen home ranges, four (#102, 128, 200, 309) would have no change in habitat and therefore would have a **no effect** determination for habitat. Nine sites would have no

change in proportion of PFF1, and four sites would have 1 percent or less change in low RHS PFF1. Nine sites would have a reduction in total PFF2 with the most occurring in sites 307 (5%) and 367 (3%). Based on the criteria described above for the intensity of effects from PFF removal, four of the sites (#142, 162, 256, 308) would have a **may affect, not likely to adversely affect** (NLAA) and five sites (#98, 101, 143, 307 367) would have a **may affect, and likely to adversely affect** (LAA) determination for habitat.

### Effects to Habitat Outside of Known Home Ranges

Proposed activities that would occur outside of historic NSO home ranges would affect habitats as shown in in Table 14, including 147 landings (16 heli), 3 miles of temporary road construction, and 3.5 miles of roadside danger tree abatement. Landing construction would be within capable or non-forest areas.

**Table 14. Spotted Owl Habitats within Proposed Chetco Bar Fire Area Salvage Activities outside of NSO home ranges.**

Activity	Non-Forest	Capable	Dispersal	NRF	PFF1/ High RHS	PFF1/ Low RHS	PFF2/ High RHS	PFF2/ Low RHS	Total
Salvage Units	1	2236	0	0	4	82	50	340	2713
Landing construction	0	69	0	0	0	0	0	0	69
Temp road construction (3.5 mi)	<1	2	0.5	<1	<1	<1	<1	<.1	3
Haul Route Danger Tree Abatement	10	171	5	9	3	0	11	26	235
<b>Grand Total</b>	<b>11</b>	<b>2478</b>	<b>6</b>	<b>9</b>	<b>7</b>	<b>82</b>	<b>61</b>	<b>366</b>	<b>3020</b>

### Effects to Spotted Owls from Disturbance

The potential for noise-producing activities to cause harassment of spotted owls is dependent on the background or baseline levels of noise present in the environment. In areas that are continually exposed to higher ambient noise levels (*e.g.* areas near Level 3 and above well-traveled roads), spotted owls are probably less susceptible to small increases in noise frequency because they are accustomed to such activities. Spotted owls do occur in areas near human activities and may habituate to certain levels of noise. However, spotted owls rarely nest at or immediately adjacent to roads or edges (Kerns and Allwardt 1992).

Effects to spotted owls resulting from noise, human intrusion or smoke-related disturbance are not well documented. In the most recent review of spotted owl research, none of these types of disturbance were considered a threat to the species (Courtney et al. 2004). However, at the individual level, based on anecdotal information and effects to other bird species (Wesemann and Rowe 1987, Delaney et al. 1999, Delaney and Grubb 2001, Swarthout and Steidl 2001, USDI FWS 2003, USDI FWS 2005, USDI FWS 2012), disturbance to owls is thought to increase with proximity to the activity and an increase in noise level, similar to results reported for bald eagles (Grubb and King 1991), gyrfalcons (Platt 1977), and other raptors (Awbrey and Bowles 1990).

Given that occupancy of NSO sites in the action area has not been known for many years and owls in sites severely affected by the fire may have shifted their activity centers, any substantial

patches of remaining high RHS NRF may be occupied by NSO. Salvage ground-based harvest of units within 65 yards or helicopter units within 120 yds to ¼ mile of substantial high RHS NRF has the potential to disturb NSO during the breeding season. The following units within disturbance distances of patches of high RHS NRF substantial enough to potentially be occupied by nesting owls would have a seasonal restriction for cutting and helicopter yarding (appendix A, PDC NSO/MAMU 1:

Heli units: 26, 107, 110, 111, 125, 170, 171, 172

No proposed helicopter landings occur within historical nest patches or core areas, and up to 8 helicopter landings may occur within historical home ranges (162, 308, 128, 101, 98, 307).

Ground-based units: 25, 93, 94, 97, 99, 100, 102, 103, 108, 113, 127, 128, 129, 138, 145, 160, 163, 165, 179

Any NSO nest sites found outside of known nest patches in the project area would be evaluated for additional operational restrictions. Removal of restrictions may occur if protocol surveys determine no NSO occupancy for the season. See Appendix A for more details. Low RHS NRF habitats are not likely to have nesting owls that would be disturbed.

Roadside danger tree treatments in this proposal are not within disturbance distances of high RHS NRF. Hauling would be restricted from March 1 through June 30 on the following maintenance level 1 and 2 roads:

FSR 1376-319, 1407-906, 1407-130, 1917-070.

Haul may occur on *FSR 1407-150 and 1917-060* before June 30 during the 2019 summer season in order to facilitate the area salvage operations. This proposed activity would disrupt up to 14 acres (disruption distance for heavy equipment) of potential spotted owl habitat during the 2019 critical breeding for northern spotted owls (12 acres NRF and 2 acres PFF). This habitat is not within any known spotted owl sites but it is within high RHS and therefore there is potential for disruption to occur during haul.

Seasonal restrictions on salvage harvest and related activities where there is a likelihood that breeding NSO may be disturbed will minimize potential for disturbance, however, the potential for haul to disturb NSO in areas with high RHS NRF along the 1407-150 and 1917-060 maintenance level 2 roads **may affect and likely to adversely affect** individuals during the 2019 critical breeding season.

Haul would not be restricted on maintenance level 3, 4 or 5 roads or other haul routes not listed above with restrictions.

### **Effects to Northern Spotted Owl Prey**

In the short term, some small isolated pockets of fire-damaged trees as well as herbaceous and resprouting vegetation in and adjacent to the salvage units will have needles and leaves and may provide some cover for NSO prey species. Depending on the affected stands' structural complexity and presence of unique habitat features, some prey species may be using burned habitats, especially as herbaceous and shrub species respond positively to the disturbance. However, much of the areas proposed for salvage harvest no longer provide habitat for primary prey such as flying squirrel or red tree vole due to the loss of canopy and green trees. Other mammalian (e.g. mice, woodrats) and avian secondary prey species may respond positively to

the new forest openings, or to the newly-created ecological edges, especially as herbaceous and shrubs respond in growing seasons immediately following fires.

Some effects to other spotted owl prey species may occur due to implementation of this proposed action, however most scientific literature focuses on high-severity fire and its effects to prey species, not on the effect of salvage on prey species. Hayes and Cissel (1995) found no significant effect on small mammals that they studied, yellow-pine chipmunk (*Tamias amoenus*), Siskiyou chipmunk (*T. siskiyou*), golden-mantled ground squirrel (*Spermophilus lateralis*) and deer mouse (*Peromyscus maniculatus*), from salvage operations.

[https://www.firescience.gov/projects/04-2-1-95/project/04-2-1-95\\_final\\_report.pdf](https://www.firescience.gov/projects/04-2-1-95/project/04-2-1-95_final_report.pdf)

Fontaine (2008) found that just after a single high severity fire event (The Biscuit Fire in SW Oregon), small mammal communities transitioned from low abundance and high species richness to high abundance and low species richness that was largely dominated by deer mice. Partial recovery to pre-fire conditions was observed at about 17 years after the fire with wood rats being present but vole species still absent relative to unburned mature forest. Post-fire salvage logging created a significant pulse of woody debris but no significant changes in densities or biomass of small mammals were observed. He concluded that fire effects on small mammal communities were much larger than those of post-fire salvage logging in the short term.

Zwolack and Foresman (2007) found varying degrees of response to stand replacement fire in their study with a large negative response from red back voles, a relatively common prey item for spotted owl. Zwolack and Foresman (2007) also found that relatively rare species such as northern flying squirrels and bushy-tailed woodrats were largely restricted to unburned areas in severely burned landscapes. This is also likely the case in areas that would be subject to danger tree abatement if there was post fire habitat present as mid story habitat and snags for denning and resting may likely be removed along the roadside at least to some extent.

Flying squirrels are generally most abundant in older, multi-storied forests with large trees and snags and relatively abundant down wood and fungi. They can also be found in younger, relatively dense commercial-aged stands. Stand replacement fire would likely remove this species from those areas and even on lower severity fire, if there is a loss of the middle stand layer they could be impacted by predators (Wilson 2010). Nevertheless, some of these stands may still provide low-moderate quality habitats for flying squirrels if they burned at low intensity.

The action area provides habitats for both bushy-tailed woodrats (*Neotoma cinerea*) and dusky-footed woodrats (*N. fuscipes*). Both of these species use small-diameter woody material for building nests which may be constructed either on the ground or in trees. Both species also forage on shrubs, forbs, grasses, and parts of conifers. Lee and Tietje (2005) concluded that a low-medium intensity prescribed understory fire had no negative effect on the survival or temporary emigration on dusky-footed woodrats in San Luis Obispo County, California and that prescribed understory fire in oak woodland is unlikely to alter woodrat populations significantly if patches of well-distributed habitats are maintained. Fire can increase the abundance of shrubby vegetation used by woodrats (along with mice and vole species). Edge ecotones created from fire can be areas of increased woodrat abundance and exposure to foraging NSOs (Zabel et al.1995). However, high severity fire is likely to remove habitat for woodrats, at least in the short term (D. Clayton per obs).

While there will be removal of potential snag habitat within the salvage units, it is expected that additional snag cavity habitats have been created throughout over 70,000 acres (about 92 percent) of fire effects within the action area not impacted by the project. The proposed action will treat about 5 percent of that snag habitat and snag retention PDCs will be implemented to provide a level of snags per acre that will support 30% tolerance levels for populations of certain snag dependent species. Where proposed units adjoin non-treated units, it can be expected that high-quality foraging habitats along these edges will be created and used by many species important to spotted owls as prey.

### 5.2.3 Effects to Spotted Owl Designated Critical Habitat

The conservation role or value of northern spotted owl critical habitat is to adequately support the life-history needs of the species to the extent that well-distributed and inter-connected northern spotted owl nesting populations at habitat carrying capacity levels are likely to persist within properly functioning ecosystems at the critical habitat unit and range-wide scales (USDI 2011). The final rule for spotted owl critical habitat defined the “physical and biological features” (PBFs) and primary constituent elements (PCEs) essential to the conservation of the spotted owl as habitats that are used or likely to be used for nesting, roosting, foraging, or dispersing” (USDI FWS 2012 pg 71897); however, regulations recently discontinued reference to PCEs, returning to solely to use of the statutory term “physical or biological features” (USDI FWS and USDOC NOAA 2016). The final critical habitat rule for spotted owls provides an in-depth discussion of the PCEs, now simply referred to as PBFs.

The effects to physical and biological features for the proposed action in context of the subunit are addressed in Table 15, and in context of the action area in Table 16. The proposed project will affect PBFs 2, 3, and 4. Post-fire foraging (PFF) habitats contain large snags or legacy snags that could provide habitat for foraging as well as structure for future suitable habitat especially on high RHS sites. Removal of any PFF1 or PFF2 with high RHS by project activities is therefore considered a direct effect to critical habitat. For the purposes of this analysis PFF habitats will be included as PBF 3. The action does not propose to salvage PFF1 classified as high RHS.

**Table 15. Project Effects to Spotted Owl Critical Habitat Subunit K LW3**

CHU Subunit and Total Acres <sup>3</sup>	Estimated Acres Burned <sup>2</sup>	Dispersal Available (PBF4)	Dispersal treated (%)	Total NRF Available PBFs 2 and 3 <sup>1</sup>	NRF Treated (%)	PFF Available	PFF2 High RHS removed (%)	PFF1 and 2 Low RHS removed (%)	Total PFF Removed (%PFF)	Percent PBFs 2 and 3 removed
KLW 2 148,929	175	33,427	0	30,961	0	0	0	0	0	N/A
KLW 3 143,862	37,148	35,966	0	67,621	0	4,012	40 (1)	169 (4)	209 (5)	0.2
KLW 4 158,299	8,825	29,567	0	38,319	0	905	0	0	0	N/A
<b>Total Unit 9 1,197,389</b>	<b>46,148</b>	<b>98,960</b>	<b>0</b>	<b>105,940</b>	<b>0</b>	<b>4,917</b>	<b>40</b>	<b>169</b>	<b>209</b>	<b>0.2</b>

<sup>1</sup> “Acres Available” reflect entire subunit values.

<sup>2</sup>Rapid Assessment Team Report, Table 5

<sup>3</sup>USDI FWS 2011, p. 71894, 71923, 71930-71935.

**Table 16. Effects to Spotted Owl Critical Habitat at the Action Area Scale<sup>2</sup>**

Subunit	Available Habitat within CH Subunit (Action Area)				Habitat <u>Removed</u> in CH subunit (Action Area)				Total Removed (Action Area)	
	High RHS PFF1 <sup>1</sup>	High RHS PFF2	Low RHS PFF1	Low RHS PFF2	High RHS PFF1	High RHS PFF2	Low RHS PFF1	Low RHS PFF2	Total PFF Removed	% of avail AA PBFs removed
KLW 3	1,969	510	353	604	0	40	10	159	209	1.6

<sup>1</sup>NRF burned at mod/high severity within 500 acres of existing or remaining NRF.

<sup>2</sup> No NRF or dispersal only will be treated

The action would affect one spotted owl designated critical habitat subunit. The proposed action would remove up to 209 acres of the available PFF habitat (PBF 3) (5 percent of available PFF and 1.6 percent of all PBFs in the action area). At the unit scale, the removal would be about 4 percent of available PFF and 0.2 percent of the NRF and PFF combined.

At the action area-scale, the removal of 40 acres of high RHS PFF2 represents 1.6 percent of the approximate 2,479 acres of high RHS PFF available, and removal of 169 acres of low RHS PFF would affect 17.6 percent of that habitat available.

This is a measurable reduction (1.6 percent) of PFB 3 (legacy features that may contribute to future suitable habitat) in the action area, however this removal is not expected to alter the subunits' ability to provide demographic support or connectivity for northern spotted owls because treatments would not result in loss of functioning NRF or dispersal across the Unit or subunits for spotted owls to disperse and reproduce and the majority of habitat affected is currently "capable" (Table 14).

## 5.2.4 Interrelated and Interdependent Effects to NSO

Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that might occur independently of the larger action, but have no independent utility apart from the action under consideration. Interdependent actions depend on the Federal action and would make no sense without it.

All proposed projects in this BA have interrelated and interdependent effects, such as noise, road construction or biomass hauling on existing system roads, and post-treatment slash and brush disposal. Brush disposal activities vary according to conditions post-treatment, fuels management objectives, requirements for retention of down woody material, and other resource management goals. Post project fuels reduction includes biomass removal, pile burning; and rearranging fuels by crushing, mulching, and lopping and scattering. All of these associated activities will implement PDCs except where otherwise disclosed in the previous analysis (e.g. disturbance effects of haul) to not adversely affect spotted owls.

## 5.2.5 Cumulative Effects to NSO

Cumulative effects under ESA are "those effects of future State or private activities, not involving Federal activities, that are reasonable certain to occur within the action area of the Federal action subject to consultation" (50 CFR 402.02). The effects of future federal actions will be evaluated during future Section 7 consultations and are not included in cumulative effects under ESA. Cumulative effects analysis of foreseeable state and private actions provide the Service and the Forest an accurate environmental baseline to assess impacts of federal actions.



The western 1/3 of the land base in the action area has a checker board pattern of ownership with private land interspersed with lands managed by BLM along the boundary of the RRSNF. There is one 174-acre parcel of private land within the RRSNF boundary. Within the action area, a range of management practices occur on private lands from residential home site development to intensive industrial timber management. In the Biological Opinion for the NWFP (USDA and USDI 1994b, Appendix G, 44-45), the Service concluded, “Non-federal landowner compliance with the take prohibition of the [Endangered Species] Act does not assure the maintenance of spotted owl dispersal habitat within Areas of Concern and checkerboard ownership nor provide for improvement of existing populations. This is evident on non-federal lands in the action area.”

Private industrial forest lands are managed for timber production and will typically be harvested between 40 and 60 years of age, in accordance with State Forest Practices Act standards.

Specific to the Chetco Bar fire, South Coast Timber Industries has been activity salvaging its lands within the Chetco Bar fire. Within this ownership, post fire there are 813 acres of NRF, as classified by remote-sensing. Although they meet a minimum of 20 inches dbh and 60 percent canopy cover, they are intensively-managed and based on field review do not meet all of the NRF requirement. The non-federal lands also consist of 1,884 acres of dispersal, and up to 677 acres of PFF, this PFF also does not meet the definition of NRF. It is assumed by the Forest that all of this habitat has been or will be harvested within the next one to two months.

## **5.2.6 Consistency with NSO Recovery Plan Recommendations**

### **Recovery Action 10**

Objectives for this recovery action include protecting or maintaining habitat or areas important for spotted owls. The proposed action will not remove or modify existing high quality NRF for NSO, and no harvest units, landings, danger tree abatement or temporary road construction would occur within any nest patch or core area with the exception of nine acres of capable habitat proposed for harvest within one core area (site 162). The majority of salvage is proposed within areas that are not currently habitat, or are unlikely to have owl use such as burned habitat beyond 500 feet of existing suitable habitat, or on high slope positions.

### **Recovery Action 32**

No RA 32 habitat has been identified in the action area. No existing NRF habitat will be modified or removed by the proposed project.

### **Recovery Action 12**

The objective for this recovery action is to retain and protect structural features associated with suitable habitat that take a long time to develop. Key project design criteria (appendix A, PDC NSO2 and MAMU1) include retention of legacy snags within units and having the majority of treatments in portions of the landscape with lower importance to owl use, will facilitate retention of future structure for NRF habitat.

## **7. BIOLOGICAL ASSESSMENT CONCLUSIONS**

### **Marbled Murrelet**

The Forest has determined the indirect effects of the proposed action would result in a **May Affect, Not Likely to Adversely Affect** determination for marbled murrelet habitat.

Proposed activities would have no effect to suitable occupied habitat, however disruption of approximately 11 acres of suitable habitat for haul on two maintenance level 2 roads during the critical breeding season (June 30 – Aug 6) result in a **May Affect, Likely to Adversely Affect** determination for marbled murrelet. These 11 acres are the same acres of disruption identified in the RRSNF danger tree abatement consultation. Seasonal restrictions for all other maintenance level 1 or 2 haul routes with adjacent suitable habitat will reduce potential impacts to murrelets.

The Forest has determined the proposed action would result in a **No Affect** determination for designated critical habitat for marbled murrelet.

### **Northern Spotted Owl**

The Forest has determined the removal of up to 152 acres of high RHS PFF2 will result in a **May Affect, Likely to Adversely Affect** determination for spotted owls. This includes approximately 84 acres of high RHS PFF2 within five home ranges, and 68 acres outside of home ranges.

The Forest has determined that five NSO owl sites would have an LAA determination (appendix B, table B-1).

Proposed road haul would potentially result in disruption of approximately 14 acres of potentially suitable habitats (NRF and PFF) on two maintenance level 2 roads during the 2019 critical breeding season (March 1 – June 30) in 2019 may result in a **May Affect, Likely to Adversely Affect** determination for spotted owls. Seasonal restrictions for all other maintenance level 1 or 2 haul routes with adjacent suitable habitat would reduce potential impacts to spotted owls.

Seasonal restrictions and PDCs for retention of legacy snags and maintaining small amounts of existing NRF and dispersal stands for roadside danger tree abatement and temporary road construction would reduce potential impacts to spotted owls.

### **Spotted Owl Critical Habitat**

The Forest has determined the removal of up to 40 acres of high RHS PFF2 habitat and 169 acres of low RHS PFF1 and PFF2 (10 acres low RHS PFF1, 159 acres low RHS PFF2) from designated spotted owl critical habitat will result in a **May Affect, Likely to Adversely Affect determination**. Retention of large or legacy snags in these areas will lessen impacts to physical and biological features that would contribute to future habitat suitability for spotted owls.

The Forest requests that a Biological Opinion be issued at such time it can be available under statutory regulations for this proposed action.



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### **Personal Communications**

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## Appendix A – Project Design Criteria

Tables A-1 and A-2 provide details of project design criteria (PDC) to be implemented for the Chetco Bar Fire Salvage Project in order to minimize impacts to wildlife species.

**Table A-1. Wildlife Mitigation measures and project design criteria**

Species	Wildlife Design and Mitigation Measure	Objective	Where Applicable
NSO1	<b>Nest patches (70 acres)</b> –salvage activities including temporary road or landing construction will not occur within any NSO nest patches.	Minimize adverse impacts to federally listed species (spotted owls).	All activities
NSO1	<b>No landing construction</b> – would occur in NSO NRF or dispersal habitat.	Avoid adverse impacts to federally listed spotted owls.	All landings
NSO2	<b>Existing snags and down wood-</b> Leave aggregates and individuals of large legacy snags (See PFF decision tree and affected units above). Avoid and protect existing large down wood ≥10 inches dbh to the greatest extent possible. Use treatment skips to avoid large dead wood (>20 inches dbh) or areas of accumulated dead wood.	Preserve existing dead wood to provide for species reliant on it; such as, owls, fisher, bats, woodpeckers, etc.	See discussion above.
NSO3	<b>Retention of hardwoods</b> – retain large hardwood snags (>10" diameter) to the extent possible. Any hardwoods felled would be left onsite.	Maintain habitat diversity and benefit multiple species.	All units
NSO4	<b>Noise above ambient</b> (chain saws, felling, yarding, road construction, heavy equipment) within disturbance distances that produce loud noises above ambient levels will not occur within restricted distances of any spotted owl nest site or unsurveyed high RHS NRF habitat between 1 March and 30 June (or until two weeks after the fledging period) – unless protocol surveys have determined the nest site or habitat not occupied, non-nesting, or failed in nesting attempt. Restricted distance for chain saws is 65 yards; for heavy equipment 35 yards).	Minimize adverse impacts to federally listed spotted owls.	26, 107, 110, 111, 125, 170, 171, 172 25, 93, 94, 97, 99, 100, 102, 103, 108, 113, 127, 128, 129, 138, 145, 160, 163, 165, 179
NSO MAMU1	<b>Helicopter or blasting operations</b> - Follow the Table A-2 (next page) for restricted distances from high RHS NRF or MAMU habitat based on helicopter size.	Minimize adverse impacts to federally listed species (NSO, MAMU).	26, 107, 110, 111, 125, 170, 171, 172
NSO5	<b>Hauling</b> on roads not generally used by the public (usually ML 1 & 2) and within 35 yards of an owl nest patch or unsurveyed high RHS NRF habitat is restricted from 1 March through 30 June (or as determined by a wildlife biologist). Exception for 1407-150 and 1917-060 in 2019 (BA p 37).	Minimize adverse impacts to federally listed species (spotted owls).	FSR 1376-319, 1407-906, 1407-130, 1407-150, 1917-060, 1917-070,
NSO6	<b>Burning</b> will not take place within 1/4 mile of a spotted owl nest patch or unsurveyed high RHS NRF habitat between 1 March and 30 June (or until two weeks after the fledging period) unless substantial smoke will not drift into the NRF habitat or protocol surveys have determined the habitat is not occupied, or a known site is non-nesting, or failed in their nesting attempt as determined by a wildlife biologist.	Minimize adverse impacts to federally listed species (spotted owls).	All activity areas

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MAMU1	<b>Protect live legacies</b> - Maintain a 70-foot (1/2 site potential tree) un-treated buffer around any live legacy trees with potential structure including trees directly adjacent to the unit boundary. No live legacy trees would be removed for any reason including roads, landings or yarding corridors.	Minimize adverse impacts to federally listed species (murrelets).	Units 25, 29, 49, 53, 55, 58, 69, 99, 100, 103, 106, 107, 127, 132, 140, 141, 147, 148, 155, 157, 159, 160, 167, 168, 169, 170,
MAMU2	<b>Noise above ambient</b> levels (felling, yarding, road construction, equipment, etc.) within 120 yards of suitable murrelet habitat - Murrelet seasonal restrictions apply 1 April through 5 August. Daily timing restrictions apply 6 August through 15 September (activities can only occur from 2 hours after sunrise until 2 hours before sunset).	Minimize adverse impacts to federally listed species (murrelets).	All activities, all units unless biologist verifies no habitat within disturbance distance.
MAMU2	<b>Hauling</b> on roads not generally used by the public (ML 1 & 2) - Murrelet seasonal restrictions apply 1 April through 5 August. Daily timing restrictions apply 6 August through 15 September (activities can only occur from 2 hours after sunrise until 2 hours before sunset).	Minimize adverse impacts to federally listed species (murrelets).	FSR 1170-540, 1407-130, 1407-133, 1407-136, 1909-120, 1917-125
MAMU3	<b>Burning operations</b> - Murrelet seasonal restrictions apply 1 April through 5 August. No burning will occur within 0.25 mile of occupied murrelet sites or unsurveyed, suitable habitat unless smoke will not drift into suitable habitat. All broadcast and under- burning operations (except for residual "smokes") will be completed in the period from two hours after sunrise to two hours before sunset.	Minimize adverse impacts to federally listed species (murrelets).	All activity areas
MAMU4	<b>Clean work sites</b> - Clean up trash and garbage daily at all construction and logging sites. Keep food out of sight so as to not attract crows, ravens, and jays (predators on eggs and young murrelets).	Minimize predation risk to federally listed species (murrelets).	All activity areas
Early seral	<b>Seed</b> landings, decommissioned roads, meadows and other openings with appropriate native grasses, forbs and shrubs to benefit pollinators, ungulates and other early-seral species.	Provide for species dependent on grasses and flowering/fruit producing plants; such as, butterflies, bees, some birds and mammals, ungulates etc.	All activity areas
Misc.	<b>Incidental sightings</b> of sensitive species - Follow the design criteria and mitigation measures in relevant wildlife consultation documents, recovery documents, management plans or Forest Service policy.	Minimize adverse impacts to at-risk species.	All activity areas
Misc.	<b>Untreated buffers of active bird nests</b> encountered during project activities would be large enough to avoid soliciting a stress response that causes and adult to flush from incubating eggs or nestlings, avoid feeding young or exhibit defensive behavior until young have fledged.	Minimize adverse impacts to breeding migratory birds.	All activity areas

Table A-2 lists the disturbance distances for NSO and marbled murrelet by activity:

<b>Table A-2: Mandatory restriction distances to avoid disturbance to unsurveyed high RHS NRF, known spotted owl sites, or suitable marbled murrelet habitat</b>		
<b>Activity</b>	<b>Distance from NSO Site or unsurveyed High RHS NRF habitat</b>	<b>Distance from suitable MAMU habitat</b>
Heavy Equipment (including non-blasting quarry operations)	105 feet	120 yds
Chain saws	65 yds	120 yds
Impact pile driver, jackhammer, rock drill	65 yds	120 yds
Small helicopter or plane	120 yds*	120 yds*
Type 1 or Type 2 helicopter	0.25 mile*	0.25 mile
Blasting; 2 lbs of explosive or less	120 yds	120 yds
Blasting; more than 2 lbs of explosives	1 mile	1 mile

\* If below 1,500 feet above ground level

Above-ambient noises further than these Table A-1 distances from spotted owls are expected to have either negligible effects or no effect to spotted owls. The types of reactions that spotted owls could have to noise that the Service considers to have a negligible impact, include flapping of wings, the turning of a head towards the noise, hiding, assuming a defensive stance, etc. (USFWS 2003).

## Appendix B - NSO Site Information

Table B-1. Existing Habitat and Effects of the Proposed Action for Chetco Bar Fire Salvage Project NSO Sites.

OWL	Total PFF (%HR)	PFF1 High RHS (%HR)	PFF1 Low RHS (%HR)	PFF2 High RHS (%HR)	PFF2 Low RHS (%HR)	Reduced PFF1 High RHS (%HR)	Reduced PFF1 Low RHS (%HR)	Reduced PFF2 High RHS (%HR)	Reduced PFF2 Low RHS (%HR)	POTENTIAL HABITAT EFFECTS DETERMINATION
98	569 (17)	180 (5)	61 (2)	166(5)	162 (5)	0(0)	14 (<1)	5 (0)	1 (0)	LAA
101	428 (13)	207 (6)	49 (1)	85 (3)	87 (3)	0 (0)	18 (<1)	5 (0)	8 (0)	LAA
102	514 (15)	212 (6)	116 (3)	19 (<1)	167 (5)	0 (0)	0 (0)	0 (0)	0 (0)	NE
128	995 (29)	384 (11)	80 (2)	220 (6)	311 (9)	0 (0)	0 (0)	0 (0)	0 (0)	NE
142	464 (14)	240 (7)	68 (2)	14 (<1)	142 (4)	0 (0)	0 (0)	0 (0)	16 (1)	NLAA
143	686 (20)	239 (7)	114 (3)	138 (4)	195 (6)	0 (0)	0 (0)	47 (1)	20 (1)	LAA
162	840 (25)	363 (11)	115 (3)	35 (1)	327 (10)	0 (0)	0 (0)	0 (0)	60 (2)	NLAA
200	543 (16)	241 (7)	117 (3)	20 (<1)	165 (5)	0 (0)	0 (0)	0 (0)	0 (0)	NE
256	345 (10)	155 (5)	31 (1)	31 (1)	128 (4)	0.25 (0)	0 (0)	0 (0)	4 (0)	NLAA
307	1239 (36)	228 (7)	112 (3)	293 (9)	606 (18)	0 (0)	8 (0)	31 (1)	123 (4)	LAA
308	172 (5)	44 (1)	35 (1)	1 (<1)	92 (3)	0 (0)	19 (<1)	0 (0)	39 (1)	NLAA
309	158 (5)	75 (2)	14 (<1)	1 (<1)	68 (2)	0 (0)	0 (0)	0 (0)	0 (0)	NE
367	691 (20)	284 (8)	101 (3)	87 (3)	219 (6)	0 (0)	0 (0)	24 (1)	58 (2)	LAA



Table B-2. Chetco Bar Fire Salvage Project Spotted Owl Site History

Owl Number	Owl Name	YEAR																																	
		1976	1978	1979	1980	1988	1989	1990	1991	1992	1993	'94	'95	'96	'97	'98	'99	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
98	Tolman Ranch	NS	NS	NS	NS	NS	P-NU	P-1DY	P-2Y	NS	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
101	Lowpra	NS	NS	NS	NS	NS	NS	NS	P-NU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
102	Nook Creek	NS	NS	NS	NS	NS	NS	P-2Y	P-NN	NS	P-NN	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	P-N	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
128	Rainbow	NS	NS	NS	NS	NS	NS		M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
142	Mineral Hill	NS	NS	NS	NS	NS	NS	NS	P-NU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
143	Coon Creek	NS	NS	NS	NS	NS	NS	P-NU	F	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
162	Mineral Creek	NS	NS	NS	NS	NS	NS	F	P-NU	NS	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
200	Redwood Springs	NS	NS	NS	NS	NS	P-NU	P-N	P-1Y	NS	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
256		NS	NS	NS	NS	NS	U	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
307	Basin Butte	NS	NS	NS	NS	NS	NS	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
308	Sunrise Creek	NS	NS	NS	NS	NS	NS	M	P-NN	P-NU	M/F (separate)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
309		NS	NS	NS	NS	NS	NS	M	M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
367	Swede Heaven	NS	NS	NS	NS	NS	M	NS	NS	NS	P-NU	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

- Summary Codes
- S Single Inferred or Confirmed - Unknown Gender
  - M Male Inferred or Confirmed
  - F Female Inferred of Confirmed
  - U Unknown Spow Inferred or Confirmed
  - P-NU Pair Occupancy - Unknown Nesting
  - P-N Pair Occupancy - Nesting Confirmed
  - P-NN Pair Occupancy - Non-Nesting Confirmed
  - P-NF Pair Occupancy - Nest Failed
  - P-#Y Pair Occupancy - Number of Young Seen
  - P-#DY Pair occupancy - Number Dead Young Found
  - NR No Response
  - NS No Survey conducted
  - BO Barred Owl
  - NA Data not available